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ABSTRACT

This handbook is intended for use in preparing persons from education, business, industry, and government for the role of DACUM (Developing a Curriculum) facilitator. An introduction discusses the following: what DACUM is, why it is unique, why it should be used, what the DACUM facilitator does, who uses DACUM, when it should be used, and its quality. The next eight sections are each devoted to one of the eight DACUM duties: (1) market the DACUM process; (2) plan the DACUM workshop; (3) recruit the DACUM workshop committee; (4) orient the DACUM committee; (5) manage the group process; (6) facilitate chart development; (7) verify DACUM results; and (8) coordinate post-DACUM activities. Each duty consists of 6-21 tasks. Information is provided on how to complete each of the tasks. Resources pertinent to each duty are found at the end of that section. A list of 31 references (with emphasis on the DACUM methodology) follows. Appendixes contain the following: DACUM transparency masters; an article, "The Nature of Task Statements"; glossary of DACUM and competency-based education (CBE) terminology; the article, "CBE: An Effective and Realistic Approach to Education and Training" (Robert Norton); a brief history of DACUM; and a discussion of potential problems in working with DACUM committees. (YLB)

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Leadership Training Series No. 67

DACUM

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DACUM HANDBOOK

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and
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Second Edition, 1997

It is essential that persons planning to coordinate and/or facilitate DACUM workshops obtain appropriate training and practice BEFORE conducting an analysis. This handbook is intended as the major resource for such training. The training required to be a qualified and certified DACUM facilitator is offered periodically by the Center on Education and Training for Employment.

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FOREWORD

This handbook has been revised and expanded for use in preparing persons from education, business, industry, and government for the role of DACUM facilitator. DACUM is an innovative approach to occupational analysis that requires a well-qualified facilitator and committee of expert workers. Extensive experience with the DACUM process has demonstrated that the role of the facilitator is not only complex but is also absolutely essential to obtaining a high-quality listing of the duties and tasks that define any given job or occupation.

The resulting occupational profile or DACUM Research Chart serves as a solid base upon which new competency-based education or training programs can be developed or existing programs updated. Because of the labor-intensive nature of the curriculum development process, and the complexity of the DACUM facilitator's role, **it is strongly recommended that persons intending to facilitate DACUM workshops obtain appropriate training and practice before conducting an analysis.** This handbook is intended as the major resource for such facilitator training.

Credit goes to Larry Coffin and Donald Glendenning of Holland College, Charlottetown, P.E.I., Canada, who introduced the author to their extensive and very successful use of the DACUM process. And, as one of the early developers of and writers about DACUM, Robert E. Adams of Nova Scotia, Canada, could perhaps more than any other be labeled as the "originator" of the Canadian version of the DACUM process. Recognition is extended to Mark Newton, who, as a Center employee in 1982, sponsored the first workshop on the DACUM facilitator's job and the development of the 1985 edition of this handbook. Audni-Miller Beach, while at the Center, also coordinated arrangements for the workshop and conducted many two-day workshops across the country.

Robert E. Norton, DACUM Program Director, organized the "DACUM on DACUM" facilitator workshop in December 1994 in Dallas, Texas, in connection with the DACUM Invitational Seminar held that year. John Hart, an internationally experienced facilitator from Humber College,Toronto, Ontario, Canada, was selected to facilitate the workshop. Experienced facilitators who served as members of the international committee of experts included Darrell Dungan, Texas State Technical College, Waco, Texas; Tim Field, St. Clair College, Chadham, Ontario, Canada; Judy Neill, Moraine Park Technical College, Fond du Lac, Wisconsin; Robert E. Norton, Center on Education and Training for Employment, The Ohio State University, Columbus, Ohio; Janie Thomas, Dallas County Community College District, Dallas, Texas; and Mike Zagorac, Dofasco, Inc., Hamilton, Ontario, Canada.

Many persons have helped with the development of this handbook. Robert E. Norton, Senior Research and Development Specialist at the Center on Education and Training for Employment, prepared the manuscript, using the results of a DACUM workshop on the role of the DACUM facilitator as the organizing frame of reference.

The results of the DACUM workshop were verified nationally (April 1996) by 42 trained and experienced facilitators. The results of both the DACUM workshop and task verification are presented in the DACUM Facilitator Research Chart contained in the front pocket of this notebook.

The manuscript, while prepared by one person, represents the thoughts and personal experiences of many persons. The author feels that it reflects the many improvements and refinements made in the process as a result of extensive and successful usage. He has personally conducted over 300 workshops and 75 training institutes. If omissions or errors are noted, they are the responsibility of the author.

This list of acknowledgments would not be complete without referencing the following persons who provided valuable reviews of the draft version of this handbook: John Hart, Krystana McLennon, Janie Thomas, Aaron J. Miller, Darrell Dungan, James B. Hamilton, and David LaBonte. Thanks also goes to Debbie Weaver for processing the many words necessary to prepare this handbook. Finally, thanks are sincerely expressed to the over 1,000 persons from 27 countries, who, since 1982, have successfully completed our DACUM Institute Training and certification program.

Darrell L. Parks
Interim Executive Director
Center on Education and Training for Employment
College of Education
The Ohio State University

Introduction to DACUM

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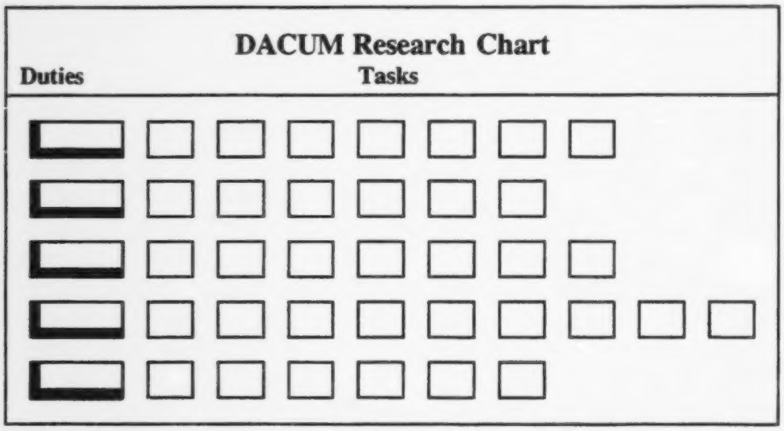
What is DACUM?

DACUM is an acronym for **Developing A Curriculum**. DACUM as used widely today is a unique, innovative, and very effective method of job, and/or occupational analysis. It is also very effective for conducting process and functional analyses. The DACUM analysis workshop involves a **trained DACUM facilitator** and a **committee of 5-12 expert workers** from the position, occupation, or other area of analysis. The profile chart that results from the usual two-day workshop is a **detailed and graphic portrayal of the duties and tasks** performed by the workers involved.

DACUM:
Unique
Innovative
Effective

DACUM Facilitator
and
5-12 Expert Workers

DACUM Research Chart



In addition to the development of precise duty and task statements, lists of the general knowledge and skills, worker behaviors, tools/equipment/materials/supplies, and future job trends/concerns are also identified.

Precise Statements:
Duties
Tasks
Knowledge and Skills
Worker Behaviors
Tools and Equipment
Future Trends/
Concerns

DACUM is based on three logical premises:

1. **Expert workers can describe and define their job/occupation more accurately than anyone else**. Persons who are working full-time in their positions are the real experts on that job. Even though supervisors and managers usually know a lot about their subordinates work, they usually lack the expertise needed for a high quality analysis.

Three premises help explain why DACUM works so well.

2. **An effective way to define a job/occupation is to precisely describe the tasks that expert workers perform**. A successful worker performs a variety of tasks that either the

customer or employer wants performed. Possessing positive attitudes and knowledge alone are not enough. Hence, finding out what the expert workers (top performers) do will give us the opportunity to prepare other experts.

3. **All tasks, in order to be performed correctly demand the use of certain knowledge, skills, tools, and positive worker behaviors.** While the knowledge, skills, tools, and worker behaviors are not tasks, they are **enablers** which make it possible for the worker to be successful. Because these four enablers are so important, considerable attention is given during the DACUM workshop to identifying lists of each. Because these attributes are different and distinct from the tasks, it is very important to keep them separate if a high quality analysis of job performance requirements is to be obtained.

DACUM has been used very effectively to analyze occupations at the **professional**, **managerial**, **technical**, **skilled**, and **semi-skilled** levels. It has also been used effectively to conceptualize future jobs, and to analyze portions (selected duties) of one's occupation. Recently, with the increasing emphasis on quality brought forth by the TQM (Total Quality Management), ISO 9000, and QS 9000 movements, DACUM also has been used widely as a basis or foundation for analyzing various industrial systems and processes.

Can analyze:
  Professional
  Managerial
  Technical
  Skilled
  Semi-skilled jobs/occupations

Special applications include analysis of:
  Future jobs
  Partial jobs
  Industrial systems
  Industrial processes
  Job functions

In terms of its common use today, the DACUM term is a misnomer. DACUM means "Developing A Curriculum" but in common practice it is used to refer to the highly visible two-day analysis workshop. At the Center on Education and Training for Employment (CETE) we use it to refer to most of the **analysis phase** of a five phase model known as SCID (Systematic Curriculum and Instructional Development). (See pages 21-22 for a graphic illustration of the SCID Model.) Specifically, at CETE, DACUM is usually used to refer to three key components of the analysis phase as follows:

1. A-2; the job/occupational analysis workshop,
2. A-3; the task verification process,
3. A-5; the task analysis process.

DACUM Components of SCID:
A-2 Job/occupational analysis
A-3 Task verification
A-5 Task analysis

For many external users, DACUM refers only to the job/occupational analysis workshop which is the most outwardly visible component. At this stage in its almost 40 year history, one is best advised to seek clarification from the user as to the specific meaning intended.

For the interested reader, a brief history of DACUM is presented in Appendix E. It traces the beginning of the DACUM concept at the Clinton, Iowa Job Corps program in the late 1960s, the work done by Robert E. Adams for Nova Scotia Newstart, the work of Larry Coffin, Donald Glendenning, and others at Holland College, Charlottetown, PEI, and the work by Robert E. Norton, Audni Miller-Beach, James B. Hamilton, and others at the National Center for Research in Vocational Education. More recently Robert E. Norton, Scot Krause, and consultants such as James B. Hamilton, Aaron J. Miller, John Hart, Charlotte Morris, Janie Thomas, Julie Bellamy, Krystyna McLennan, and Le Duckworth have carried on and expanded the number of DACUM Institutes conducted and facilitators trained. A brief review of other major users in the United States is also presented.

Why is DACUM Unique?

DACUM is unique for several reasons when compared with the interview and observation and many other traditional approaches to job/occupational analysis. The combination of the power of the following features make it the most effective and highest quality analysis process available at this time.

DACUM is the most effective and highest quality analysis process available.

DACUM Advantages

- **Group interaction—**committee members freely share ideas and hitchhike on each others contributions.
- **Brainstorming power energized—**the brainstorming process is used several times to maximum advantage to identify all of the duties and tasks.

- **Group synergy**—properly facilitated, members of the group motivate and empower each other to produce a high quality product.

- **Group consensus**—members of the committee with the facilitator's guidance assess each contribution and refine it until agreement is reached.

- **Future-oriented**—the committee is specifically asked to specify future occupational trends and concerns that are likely to change their job in the future.

DACUM is unique because of the process used to obtain superior quality.

- **Employee/Learner buy-in**—once the employees and learners know that practicing expert workers identified the duties and tasks, support for the results of the analysis is greatly enhanced.

- **Comprehensive outcome**—when 5-12 expert workers are motivated and guided for two days by a qualified facilitator, **all** duties and tasks are usually identified along with the related general knowledge and skills, worker behaviors, tools and equipment, and future trends and concerns.

- **Superior quality**—its the combination of the features already mentioned plus the fact that whenever one committee member speaks the other (4-11) members who are well qualified to do so, assess and modify contributions so as to maximize quality.

DACUM is a very efficient analysis process.

- **Low cost**—because of the highly efficient procedures used, a DACUM analysis can usually be completed in two days rather than the 25-30 days required by some methods, thus greatly reducing the overall cost.

DACUM is a low cost process.

When the DACUM committee creates its own chart from scratch, the substantive involvement of the committee members usually results in very strong support and buy-in that cannot be obtained any other way. Committee members at the end of the two-day workshop frequently offer to donate materials or equipment to the program. Other types of contributions have included offers to help recruit students, to serve as guest speakers, to host field trips, and provide site-based learning experiences for apprentices and cooperative education students.

DACUM results in strong worker buy-in and support.

Why Use DACUM?

There are many reasons for using the DACUM process. The success of any company or organization is always affected by the quality of its employees. To produce and maintain a highly skilled workforce, schools, colleges, and companies must offer the highest quality of education and training possible to prepare present and future employees for the challenges they face.

Quality of employees is important.

Accurate and specific job information is essential to good decision-making in all areas of human resource development and management. All of the approaches to quality improvement and management —TQM, ISO 9000, QS 9000, etc. require participating companies to secure and utilize precise and detailed information about their workers roles and responsibilities —work processes, systems, duties, and tasks. **Job/ occupational analysis** is the best method available for collecting that type of information. And DACUM is the best means of conducting job/occupational analysis that is available.

TQM, ISO 9000, and QS 9000 all require high quality job information.

DACUM is best method of obtaining precise job information.

Why is DACUM the best method? The excellent quality of the **product** obtained (results) and the superior **process** used (committee of 5-12 expert workers interacting) are but two of the many important advantages. Review an earlier section to learn more about the powerful group interaction, group synergy, group consensus, future orientation, and how the power of brainstorming is harnessed during DACUM workshops. Few, if any, of these positive actions can be obtained using other approaches to analysis.

Best product
and
Best process

The DACUM methodology is widely used in the United States, Canada, and several other countries simply because it is:

- Highly effective
- Quick
- Low cost

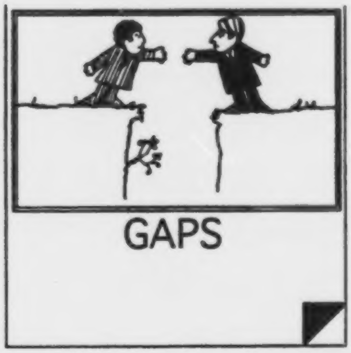
DACUM is
- ***Effective***
- ***Quick***
- ***Low cost***

Another reason why DACUM is extensively used by educators and by trainers when they are establishing a new education or training program or revising an existing one is that they must

WHAT SHOULD BE TAUGHT?

somehow carefully answer the question of: **WHAT SHOULD BE TAUGHT?**

This, while being a very important question, is not an easy one to answer in a quality way. And yet this very important question has to be answered by someone or some group for every training and educational program offered. How do you answer it in your school, college, company, agency, or business?



All too often there is a big gap between what is offered to learners in the classroom/lab and what is going on in the real world of work. For more information, see pages 23-24 for an article on Avoid the "What Errors" of Curriculum Development. This **very serious gap** between what is offered and what is needed is caused by what the writer has referred to as the "**Curriculum What Errors**." These errors can be stated in many ways but may be summarized as twofold:

The "Curriculum What Errors" are very serious and very costly.

1. Failure to teach **what** should be taught (the latest concepts, methods, skills, techniques)
2. Teaching **what** should not be taught (the outdated concepts, processes, technology, information)

These what errors are very serious and very costly. They, in reality, cheat the learner, the taxpayers, and the companies. DACUM is an effective, quick, and low cost process for significantly reducing these errors.

DACUM is
Effective
Quick
Low Cost

The very powerful combination of being effective, quick, and low cost has made the DACUM process very attractive to many schools, colleges, companies, and government agencies.

Another important reason for using DACUM has been and continues to be the strong desire of many trainers and educators to establish a relevant, up-to-date, and localized research base for curriculum and instructional development. Clearly, for **educators** a curriculum base that is soundly determined with maximum input from the businesses who are going to employ the students is needed. For **business trainers** and developers, a curriculum base is needed that is specific to the companies needs and that has been developed in such a way as to obtain strong employee buy-in.

Establishes a locally relevant research base.

To permit any company or educational agency to identify its own localized research base for curriculum development, an alternative to traditional, time-consuming, and costly approaches to job/occupational analysis was needed. DACUM has become that powerful alternative!

DACUM is a powerful alternative.

Another reason why DACUM is particularly well suited for educational institutions and training agencies that are implementing or are planning to implement competency-based education (CBE) or performance-based training (PBT) programs is that the first essential element in any CBE/PBT program involves the careful identification of the tasks (which are usually referred to as the competencies to be obtained) upon which the instructional program will be based. The reader interested in more information about CBE/PBT programs should review Appendix D. For a list of terms closely associated with CBE and DACUM, see Appendix C.

CBE/PBT programs requires the rigorous identification of worker competencies.

For Educators

An additional benefit that is very important to schools and colleges is DACUMs public relations value to the educational institution or other agency doing the DACUM. Once employers understand the purpose and the process of DACUM, their first reaction is almost one of sheer shock when they realize that this school or college really wants industry to help them identify the competencies needed by workers in their field. So many employers are familiar with the "rubber stamp" role that they are so often asked to perform on ad hoc committees (and sometimes even on occupational advisory committees) that it often takes them a while to understand that this school or college is really serious about wanting industry to help determine **what** tasks students must be able to perform in order to make program completers valuable future employees.

Once employers understand what is to be done via DACUM and how the results will be used, it is a rare employer who will refuse to cooperate. Instead, many colleges who have used DACUM report such reactions as the following:

- Offers of equipment (loans and gifts) and supplies
- Offers to host field trips
- Willingness to provide subject matter experts
- Offers of supportive training materials
- Offers of resource persons to help teach in emerging technology areas
- Requests for inservice training programs to meet local industry needs
- Increased enrollments in adult upgrading programs
- Increased support of the educational institution in a variety of ways by local business, industry, labor, and management

Long lasting, beneficial linkages can be established.

While the public relations value of DACUM is secondary to its main purpose, its significant, long-term impact is too important to overlook or lightly dismiss. Linkages can be developed which, if properly nurtured can be long lasting and extremely beneficial.

For Business Trainers

Business needs to design new training programs quickly and effectively. The skills and competencies needed must be job or process specific, if they are to meet the companies production and quality goals. Business needs highly job-relevant training and they must reduce the start-up time and cost for the design and delivery of programs. As one company reported, they cannot afford to spend 30 or more days on an occupational analysis if a two-day DACUM workshop can do the same job better and much cheaper.

Business requires job-specific training.

Two days
vs.
Thirty days

Another important benefit mentioned by many companies is that DACUM defines the "as is" of the job. It identifies exactly what is going on in the job currently. One training manager of a large company reported, "This is critical information to have because in all the DACUM's we have conducted - what the supervisors think the employees are doing and what the employees are actually doing were two different things. Once you have a clear understanding of what actually is going on in the job, then you can make logical decisions in regards to re-engineering or re-structuring the job. You can answer questions such as: are all these tasks value added; should they be doing what they are doing; what do we want them to be doing that they are not doing; why have they had to take on these low value added tasks, etc. Given this detailed information, you can redefine the job from the "as is" to the "to be", to the benefit of the company."

Other reasons why companies use DACUM is because of:

- The significant employee involvement and buy-in obtained.
- The solid foundation provided for new program development.
- The basis provided for assessing the relevance of existing programs.
- The accurate job descriptions obtained.
- The detailed information provided for worker career counseling and training needs assessment.
- The legally defensible basis provided for developing competency and performance tests.
- Its ability to describe job operations, processes, and systems to meet TQM, ISO 9000, and QS 9000 quality requirements.
- The information it provides for job redesign.
- The basis it can provide for developing performance appraisals and task and performance standards.
- The basis it provides for developing and selecting training materials, tools, and equipment.
- It enables companies to meet ADA (American Disabilities Act) job description requirements.
- It provides the data needed to ensure job efficiency; assurance that each task within a job is value-added and efficient.

What Does The DACUM Facilitator Do?

To produce a highly skilled workforce you must offer the highest quality of education and training possible to the students and trainees. To offer that type of preparation, you must answer the question of "What should be taught" very carefully. And, teaching people about the DACUM process should be no exception to the rule.

The first DACUM facilitator profile, done in 1982 and verified nationally, became the structural research base for the first edition of this handbook. More recently, in December 1994, another "DACUM on DACUM" was conducted using a cadre of six highly experienced DACUM facilitators as panel members, and an internationally experienced consultant as the DACUM workshop facilitator. The workshop results again were nationally verified by **qualified** persons (regular users of the process who had conducted six or more workshops) from the U.S. and Canada. The resulting **DACUM Research Chart for DACUM Facilitator** may be found in the inside front pocket of this notebook cover.

A DACUM on DACUM workshop was conducted in December 1994.

The task verification for the DACUM Facilitator analysis was completed in April 1996. As was done for the first handbook, this new DACUM Research Chart and the verification results have served as the research base for developing this handbook and helping the writer determine what should be addressed, and to what depth. The data on task importance and task learning difficulty was especially valuable to the writer. Data-based decisions are always better and easier to make.

DACUM Research Chart on the job of DACUM Facilitator was verified nationally in 1996.

Except for the "Introduction to DACUM" section which is necessary to provide some background information, the rest of this handbook is structured around the duties and tasks identified by the DACUM committee and verified by the experienced respondents. In addition to the narrative information about each task of each duty, resource materials, which are referenced in the task to which they pertain (e.g.,The

DACUM Connection Flyer) are presented at the end of each duty section.

Some items, like the glossary, that pertain to all or several of the duties and tasks have been placed in the Appendix. It is hoped that this handbook format, which closely reflects the real world of the DACUM Facilitator, will be easy to read and use as a reference.

The facilitator's job is a challenging one that requires a careful blend of knowledge and skill, science and art. Hence, **it is absolutely essential that persons intending to facilitate DACUM workshops obtain appropriate training and guided practice before conducting a DACUM analysis.**

It is absolutely essential to obtain training and guided practice BEFORE conducting a DACUM analysis.

What is the Difference Between the DACUM Facilitator and the DACUM Coordinator?

In the first handbook, the term **DACUM coordinator** was used to refer to the person who plans the occupational analysis process, makes the necessary pre-workshop arrangements — including the selection of the committee of occupational experts—and provides for verification of the tasks. He or she may or may not facilitate the actual development of the DACUM chart, however, as somewhat different skills are required for that process.

The person who actually leads the DACUM occupational analysis workshop was referred to as the **DACUM facilitator**. Although the same person, if qualified, can function as both the coordinator and facilitator, these functions are often handled by different persons. Whereas many persons can perform quite satisfactorily in the coordinator's role (i.e., carry out the pre-workshop planning and arrangements and the post-workshop activities), the facilitator's job requires some special personal qualities and characteristics.

DACUM Facilitator
vs.
DACUM Coordinator

In the 1996 DACUM facilitator analysis and in this handbook, the jobs of both the DACUM facilitator and DACUM coordinator are purposely integrated. It is recognized that in some agencies all of the tasks are performed by one person while in other agencies, two or more persons may be involved. The DACUM on DACUM committee felt that it was very important that DACUM facilitators be knowledgeable and skilled in all of the tasks involved, as they need to be able to train others and/or oversee the performance of these tasks by others. The quality of the DACUM workshop can be seriously harmed, for example, if the tasks in Duty B—**Plan the DACUM Workshop** and Duty C—**Recruit the DACUM Workshop Committee** are not carried out well. The ability to delegate and supervise the performance of these tasks requires a high degree of competence on the part of the facilitator. The remainder of this handbook will refer only to the facilitator.

This handbook refers only to the DACUM Facilitator.

According to the "DACUM on DACUM" committee, the facilitator should exhibit the following worker behaviors:

Facilitator Worker Behaviors

- A professional image and outlook
- A sensitivity for others
- The ability to establish and maintain enthusiasm
- A sense of humor
- The ability to show empathy
- The ability to display and maintain a positive image
- Patience
- The ability to make decisions

In addition, the practical experience of the author in conducting over 300 DACUM workshops indicates that the facilitator must also possess the following characteristics:

- Skill in occupational (job) analysis procedures
- The ability to display warmth and establish rapport quickly with participants
- A high degree of sensitivity to both verbal and nonverbal communication
- The ability to motivate and encourage participants
- A willingness to assume and "act out" the role of **process** expert while according participants the role of **content** experts
- An appreciation of the value of small-group process so that participants are allowed to work things through by themselves
- Excellent listening skills and memory, since the facilitator must be able to "store" many of the participants' contributions in his or her memory and be able to retrieve them as needed
- The ability to obtain consensus from the participants

The facilitator also needs to understand the DACUM process itself, which is neither vague nor unstructured. Although there are some alternatives and some flexibility in parts of the process, it also has some definite parameters and utilizes a specific sequence.

As should now be apparent, facilitating a successful DACUM requires a multitude of skills, many of which cannot be quickly acquired. The qualities described are extremely important to successful performance as a facilitator. The process calls for more than a competent "discussion leader" or "curriculum developer."

The facilitator must establish and maintain the group's pace, balance the group's participation, clarify vague statements by probing for more details, and insist on selection of the most appropriate action verbs, task statement modifiers, and objects (nouns) in composing duty and task statements. The facilitator must motivate and lead the group and control the process, yet never impose content judgments or decisions on the participants.

Persons who are considering becoming a DACUM facilitator should carefully assess their personal traits and characteristics before deciding to enroll in a DACUM facilitator training program. And those responsible for helping select facilitator trainees need to keep these qualities in mind so as to enable all participants to make the best investment of their time and energy.

Who Uses DACUM?

DACUM is used by:

Educational Agencies

- **Educational agencies** such as state departments of education, community and technical colleges and institutes, proprietary schools/colleges, colleges of education and universities, and secondary schools.

A list of some of the educational agencies served by the Center on Education and Training for Employment, College of

Education, The Ohio State University (hereinafter referred to as CETE) follows.

Educational Clients

Selected Educational Agencies Served

DACUM-related services have been provided to a large number of agencies, either by contract or through participation in Center-sponsored DACUM Training Institutes. Client agencies have included secondary, postsecondary, and higher education institutions, state educational agencies, and federal education and manpower agencies, both domestic and foreign. Following is a partial listing:

Arizona Center for Vocational Ed
Arkansas Dept of Ed
Asian Pacific Skill Development Prog
Brevard Community College
Caldwell Community College
Carl Sandburg College
Catonsville Community College
Central Arizona College
Central Virginia Community College
Chesapeake College
Clark County Community College
Columbus State Community College
Dallas County Community College
Delaware Dept of Public Instruction
Department of Education, Virgin Islands
DeVry, Incorporated
Dundalk Community College
Dyersburg State Community College
Education Management Corp
Elgin Community College
Ferris State University
Florida Department of Education
Fox Valley Technical College
Grant MacEwan Community College
Houston Community College
IL State University
IN State University
Indiana Vocational-Technical College
Kellogg Community College
Kirkwood Community College
Longview Community College
Madison Area Technical College
Maine Bureau of Vocational Ed
Memphis City Schools
Mercer County Community College
Milwaukee Area Technical College
North Central Technical Institute
N. Iowa Area Community College
Northern Illinois University
Northern Maine Technical College
Ohio University
Ohio Department of Education
Renton Vocational Technical Institute
San Antonio Community College
San Luis Coastal Unified School District
Seattle Central Community College
St. Clair College of Applied Arts
Stanly Community College
Texas Community College Coordinating Board
University of Central Florida
University of Missouri-Columbia
Valencia Community College
Virginia Department of Education
Vocational and Industrial Training Board
York Techn'l College
Walla Walla Community College

Business/Industry Use

- **Business and Industry** to do all kinds of human resource development and quality management decision-making. Many businesses and industries (hereinafter referred to as businesses) are using DACUM for job and occupational analysis as a basis for training program development, job descriptions, career development, job restructuring, etc. Recently a number of companies have been very successfully using the method with some adaptation to analyze job

Business Clients

Selected Business Clients Served

AT&T
American Electric Power
Arthur Anderson
Ashland Chemical
Blue Cross/Blue Shield
Champion Internat'l
Control Data
Defense Supply Centers
Discover Card
Dofasco, Inc.
Eastman Kodak
Ericsson, Inc.
General Motors
General Electric
John Deere
Kroger
Lubrizol
Lucent Technologies
Mennen
Monsanto Chemical
Motorola, Inc.
Navistar International
Newport News Shipbuilding
Roadway
UAW-Ford
United Airlines
Unilever
Virginia Power

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processes and systems rather than for the more common identification of duties and tasks.

Governmental Clients

- **Governmental and military agencies** usually as a basis for training program development, job descriptions, job functions, or career development. DACUM has been used by federal, state, and local government agencies. The U.S. Army and Navy have also made considerable use as have personnel at the various Defense Supply Construction Centers.

Government and Military Agencies Served

Columbus Public Authority
Defense Supply Construction Centers
Government Printing Office
Internal Revenue Service
Newport News Shipbuilding
Ohio Extension Service
Ohio Department of Development
Industrial Commission of Ohio
Ohio Bureau of Employment Services
U.S. Army
U.S. Navy
Wisconsin Department of Workforce Development

Foreign Clients

- **Agencies in Other Countries** for much the same reason that U.S. educational agencies, businesses, and governmental agencies use the process. Twenty-seven countries have either requested CETE personnel to conduct training in-country or have sent personnel to the states for training.

Foreign Countries Served

Australia
Barbados
Canada
Chile
China
Dominican Republic
Fiji
Germany
Indonesia
Israel
Japan
Korea
Kuwait
Kyrgyzstan
Malaysia
Mauritius
Netherlands
New Zealand
Nicaragua
Philippines
Saudi Arabia
Singapore
Sri Lanka
Sweden
Turkey
Tunisia
Venezuela

When Should DACUM Be Used?

DACUM has many uses.

Although the DACUM is being used for a great many purposes, it is ideally suited for researching: (1) the competencies and skills that should be addressed in the development of new education and training programs, and (2) the competencies and skills that should be delivered by existing programs. It is also very well suited to what may be called a number of special applications which are presented later in this section.

The Development of New Programs

Development of new programs.

Once the need for a **new** instructional program has been established, DACUM can be used to quickly identify the tasks that a successful worker must be able to perform on the job. Such use of the DACUM process will ensure that the new program will be relevant if the tasks (competencies) identified in the process are used as the basis for subsequent program planning and instructional development.

Review of Existing Programs

Revising existing programs.

A DACUM committee can be convened to identify the competencies that should be delivered in an **existing** instructional program, just as it can be convened to identify the competencies for a new program. In this case, once the competencies have been carefully identified by industry experts, the existing program and instructional materials are examined to see if they address all the required tasks. Modifications of the education or training program are then made, where necessary, to ensure current relevance of the program.

Special Applications

DACUM has also been successfully used in what could be called "special applications" of the basic process. For example, in cases where qualified workers could not be released for a two-day workshop, modified DACUMs in which literature reviews were used to initially identify all relevant duties and tasks have been conducted with reasonable success. In these cases, one day has generally been adequate for the committee to review and accept, modify, or reject each duty and task statement derived from the literature. A weakness of this adaptation is that this approach often restricts the committee's vision and it does not provide the same opportunity for original input to program development. It also does not elicit the same support from committee members as the standard process.

Analyze a portion of workers jobs.

DACUM has also been used successfully to identify the competencies required of workers when they are engaged in a specific portion of their total job. For example, teachers who have been successful in implementing competency-based education have been able to identify the additional competencies needed by traditional teachers who want to convert to the CBE approach.

DACUM can analyze company processes and systems.

The DACUM process has also been used by several companies to analyze various systems, operations, and processes that are the responsibility of more than one or two worker job classifications. For example in a recent analysis of a sophisticated test reporting system, engineers, technicians, support personnel, and clerical personnel were all appropriately involved because they all literally "had a piece of the action" and the process will not work without each group doing their part.

The same type of analysis, although more complex, can be performed on a system which may be comprised of several job operations or processes. With the strong demand that currently exists for meeting ISO 9000 and QS 9000 requirements, DACUM facilitators are likely to be conducting more and more process analyses.

Common Uses of DACUM.

Another way to answer the question of when should DACUM be used, is to present a specific list of some of the more common uses: See page 25 for a list of Some DACUM Uses.

Some Common Uses of DACUM

- Curriculum development
- Curriculum review and revision
- Training needs assessments
- Competency test development
- Worker performance evaluations
- Job descriptions
- Process descriptions (ISO 9000)
- Student recruitment
- Student counseling
- Student achievement records
- Training program review
- Curriculum articulation
- Tech prep program development
- Job modifications
- Career development/planning

What About DACUM Quality?

DACUM quality must be maintained.

Although the DACUM process lends itself to a number of regular and special adaptations, two critical factors are always necessary to obtain a valid and high quality DACUM chart. The **first** is to assemble a **committee of five to twelve (5-12) expert workers** in the area under study, and the **second** is to use a **trained DACUM facilitator**. Without both of these, the quality of the resulting analysis is questionable, at best.

DACUM facilitators must be trained.

While the **DACUM Research Chart for DACUM Facilitator** answers very well the question of what the DACUM facilitator must do to be successful, it does not provide a specific set of criteria that a facilitator can use to assess the quality of a workshop and its resulting chart. And, it appears, that a clear set of evaluative criteria is needed as the process is rapidly gaining popularity in the U.S. and throughout the world.

Most DACUM facilitators are doing an excellent job, while others are attempting to facilitate workshops without the benefit of appropriate training and without much regard for the quality of the process used or the product produced.

Far too often task statements lack appropriate qualifiers. We cannot accept task statements such as "develop a plan" or "maintain standards" and expect the reader to realize that we meant "develop a floor plan" and "maintain sanitation standards." Nor can we mix very different things together — worker behaviors, skill statements, tool and equipment statements —with actual task statements if we indeed want a high quality analysis and a solid foundation for curriculum development.

DACUM Quality Performance Checklist.

While it is gratifying that researchers and developers want to use DACUM, or some modification, in the important national standards work being undertaken, it is disappointing that the process is being misused in many situations. Some of the procedures used are so far afield from recognized DACUM standards that a different name should be used to describe their procedures. In an effort to address some serious concerns about maintaining DACUM quality, a DACUM Quality Performance Criteria checklist has been developed to help DACUM facilitators plan and conduct quality workshops and evaluate both the **process** and **product** of their workshops. See pages 27-30 for a copy of Maintaining DACUM Quality.

DACUM charts need updating to maintain quality.

Another aspect of maintaining DACUM quality deserves attention at this point. Regardless of whether the DACUM chart is for business or educational purposes, it will need to be updated every few years. It is difficult to provide guidance as to frequency of updating necessary because the amount of technological change occurring varies widely from occupation to occupation. In fields like computer technology, changes are occurring very rapidly, whereas professional and managerial occupational changes are usually slower.

Charts should be revised at least every 3-5 years.

Some schools and colleges have adopted a policy of revising their charts once every three to five years, depending on the amount of change believed to have occurred. A training or other type of advisory committee or council is charged with making the additional changes needed between DACUM workshops.

SCID: A Model for Effective Instructional Development

by Robert E. Norton

HOW DO YOU SAVE MONEY ON CURRICULUM DEVELOPMENT? By using a new model that is so efficient and effective, it practically guarantees the production of relevant high-quality CBE materials at the lowest possible cost. The SCID model was carefully developed to incorporate the critical tasks needed to develop the kinds of CBE curriculum and instructional materials needed to train tomorrow's work force today. Twenty-three components—a few optional but most essential—are grouped into five phases: Curriculum Analysis, Curriculum Design, Instructional Development, Training Implementation, and Program Evaluation.

Phase 1. **Curriculum Analysis** comprises six components. First is a *needs analysis,* in which actual needs are determined, for example the need for training, for a change in management or production procedures, for updated technology, or some combination of needs. If the need for training is confirmed, a *job analysis* is next (the DACUM approach is recommended). Next is *task verification*, which can extend involvement in the job analysis from a few to 100 or more expert workers and can provide a means of rating the importance and difficulty of each task and obtaining other valuable decision-making information.

Armed with this information, it is possible to *select tasks* (or deselect them, as some industry trainers say) for inclusion in the program.

The next component in this phase is the *standard task analysis.* The information obtained in this step is absolutely essential in identifying performance steps and decisions, essential knowledge, industry standards, etc. needed to develop accurate and relevant teaching and learning materials. A sixth component, the *literacy task analysis* is recommended but is optional here.

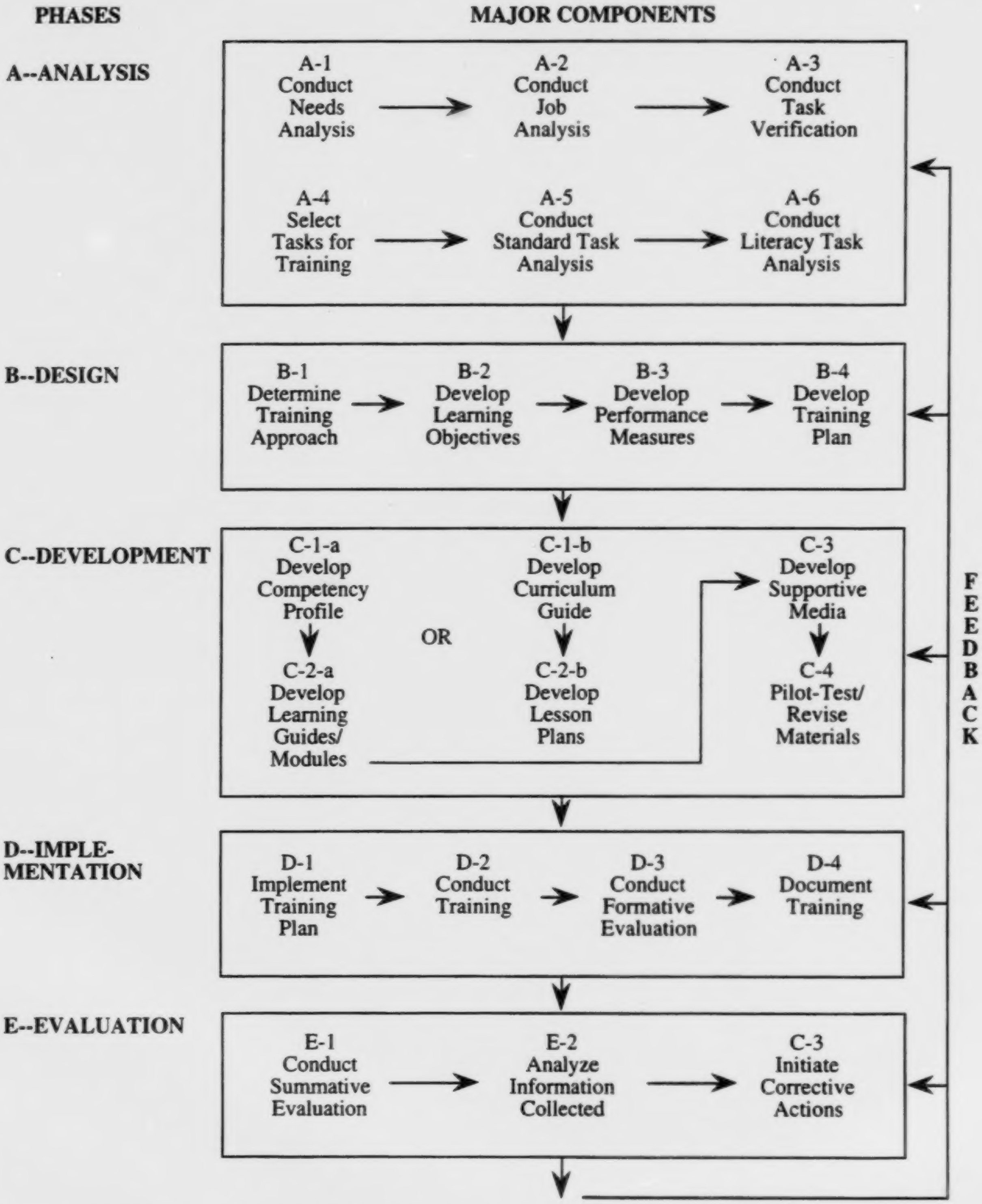
Phase 2. **Curriculum Design** comprises four components. Based on information collected in Phase 1, it is necessary to *make decisions about the training approach*—type of instructional program and materials to be developed, the degree to which instruction will be individualized, and support media to be developed. Next is the *development of learning objectives* for each task or group of tasks, followed by the *development of job performance measures.* This phase concludes with the *preparation of a training plan,* which should be fairly detailed and include all aspects of personnel and facility and equipment needs. Implementation of this plan must occur concurrently with the development phase.

Phase 3. **Instructional Development** comprises four main components, although depending on the type of materials to be produced, the first two components may vary. One choice—usually for competency- or performance-based programs—is to *develop a competency profile* and then to *develop learning guides or modules.* The second choice—usually for more traditional programs—is to *develop a curriculum guide* and then to *develop lesson plans.* The third component in either case is to *develop supporting media,* which can be simple transparencies, posters, and slides, or more expensive videotapes or interactive videodiscs. Appropriate media add variety and clarity to the instructional process, motivate the learner, and help demonstrate or illustrate difficult concepts and procedures. The last step in development is to *pilot-test and revise the materials.* This step is important and worth the extra time and money to make needed improvements and modifications. Keep in mind that the purpose of these materials is to help learners achieve the performance objectives as efficiently, effectively, and economically as possible. In many cases, existing materials and resources may be used or adapted.

Phase 4. **Training Implementation** comprises four components, beginning with *activating the training plan* developed in the design phase. By now, learners have been recruited, instructors selected and trained, and the availability of facilities, supplies, equipment, and other resources confirmed. The next step, after pretesting, is to *conduct the training* and then to *conduct a formative evaluation* of learner and instructor performance. This information is invaluable in making in-course corrections, should this become necessary. *Documenting training* in the form of student achievement and instructor performance records is the final step in this phase. The student competency profiles can be used to report achievement to parents and potential employers as well as to administrators.

Phase 5. **Program Evaluation,** the final phase, comprises three components. With the formative evaluation complete, the next important step is to *conduct the summative evaluation* to collect data for use in decisions on maintaining or improving the education or training program. This involves gathering data on the overall instructional process, program outcomes, student follow-up, worker productivity, and cost-effectiveness. *Analyzing and interpreting this information* will lead to recommendations on program improvement and, finally, *taking corrective actions.* Completion of the evaluation phase produces the performance data and feedback vital to any education or training system concerned with quality management and proving its worth.

The Center on Education and Training for Employment periodically conducts workshops on the SCID model. If you would like to find out more about this training activity for your organization, contact *Bob Norton at CETE, The Ohio State University, 1900 Kenny Rd., Columbus, OH 43210-1090; (800) 848-4815 or (614) 292-4353.*


PHASES
MAJOR COMPONENTS
A--ANALYSIS
A-1 Conduct Needs Analysis
A-2 Conduct Job Analysis
A-3 Conduct Task Verification
A-4 Select Tasks for Training
A-5 Conduct Standard Task Analysis
A-6 Conduct Literacy Task Analysis
B--DESIGN
B-1 Determine Training Approach
B-2 Develop Learning Objectives
B-3 Develop Performance Measures
B-4 Develop Training Plan
C--DEVELOPMENT
C-1-a Develop Competency Profile
OR
C-1-b Develop Curriculum Guide
C-3 Develop Supportive Media
C-2-a Develop Learning Guides/ Modules
C-2-b Develop Lesson Plans
C-4 Pilot-Test/ Revise Materials
FEEDBACK
D--IMPLE-MENTATION
D-1 Implement Training Plan
D-2 Conduct Training
D-3 Conduct Formative Evaluation
D-4 Document Training
E--EVALUATION
E-1 Conduct Summative Evaluation
E-2 Analyze Information Collected
C-3 Initiate Corrective Actions

SYSTEMATIC CURRICULUM AND INSTRUCTIONAL DEVELOPMENT (SCID)

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March 94

the
DACUM
connection

AVOIDING THE "WHAT ERRORS" OF CURRICULUM DEVELOPMENT

Do you want to cheat your students or trainees?
o you want to cheat your company?
o you want to cheat your fellow taxpayers?

Your answer to all of these questions is likely "No." But if you are committing "what errors" in your curriculum development, chances are you are doing just these things.

What, you ask, are "what errors?"

They are two major types of errors you should be avoiding: The first, and most serious, is *failing to teach what should be taught* to keep your program current with industry and real-world needs. The second, the obverse of the first and almost as serious, is *teaching what is no longer needed and relevant.*

These errors have important significance for students, trainees, taxpayers, and companies. When curricula contain these errors, it means students are not getting the prerequisite knowledge, skills, and attitudes needed to progress effectively in their studies. In failing to teach students what they need most to be successful, we are not giving them the opportunity to be maximally successful. Thus, we are cheating the student and the taxpayer because the quality of educational services being provided is lower than they should be able to expect from public institutions of learning.

Failure to teach what should be taught—competencies needed for success on the job—is not only a disservice to the trainees, who will be unable to perform well, but is unfair to the company that pays for training and gets a substandard product. Without the opportunity to acquire the necessary knowledge, skills, and attitudes, the employee/trainee has little chance of maximizing his or her productivity, and the employer has little chance of maximizing the company's profits and product quality. Further, it is fair to say that beyond affecting employees and employers, failure to teach what should be taught ultimately affects the economic well-being of the community, the state, and the nation.

Teaching what is no longer relevant and needed, the second type of error, occurs when out-of-date textbooks, courses of study, reference materials, lesson plans, tools, equipment, supplies, and materials are used. It occurs when new tasks and competencies are added to programs without removing outdated content. It occurs when teachers and instructors fail to keep abreast of new developments in their field and teach old methods and outdated technologies. It occurs when old equipment and materials are used because it is too expensive and resources are inadequate to acquire needed new items.

Teaching what is no longer relevant cheats the student by taking valuable time that should be spent on what is relevant. Here, again, wasted instructional time and resources translate into longer learning time for the employee/trainee, high costs and low value for the employer, and wasted taxpayer money.

As long as these "what errors" are present, we will not have the high-quality vocational-technical or business-industry training programs that are so essential to building a globally competitive economy.

A graphic example of the effect of curriculum "what errors" may help illustrate their importance. When this author was seeking his first position as a high school vocational teacher, the interviewing party was unexpectedly large, consisting of the superintendent, the principal, two board members, and the entire occupational advisory committee. It seems that there was great concern that the previous teacher had spent 35 percent of class time on the vocational youth organization and 25 percent on judging contests, although only 5 percent was recommended for each. That meant the teacher had "wasted" some 50 percent of important teaching time, failing to teach what should be taught. The teacher, it seems, had been omitting important competencies dealing with the development of students' mechanical and management skills. So concerned was the advisory committee about these "what errors" that they insisted on personally interviewing all candidates.

How do curriculum "what errors" occur?

Sadly, the answer is that they are likely to occur whenever we teach (a) what we know best, (b) what we were taught, (c) what we enjoy teaching, (d) what we have experience with, (e) what happens to be included in the textbook, (f) what someone else's occupational analysis, done somewhere else, says to teach, or (g) what is in our old (3-5-year-old) occupational analysis.

"What errors" occur whenever the question of what is to be taught is not carefully researched and correctly answered—in other words, more often than we would like to think.

These errors are serious in terms of their likely effect on the students, their community, and their employers. Most often, two or more errors are involved at once, further compounding the problem.

The good news is that these errors can be eliminated or, at least, greatly reduced. By conducting a vigorous local analysis of the occupation(s) in question, it is possible to find a responsible answer to the question of "what should be taught?" The Systematic Curriculum and Instruction Development (SCID) model has proven itself to be one good way to find the answer.

(continued)

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SCID begins with a six-component analysis phase as outlined below, followed by the design and development phases.

PHASE A: ANALYSIS

Major Components

A-1 Conduct Needs Analysis
A-2 Conduct Job Analysis
A-3 Conduct Task Verification
A-4 Select Tasks for Training
A-5 Conduct Standard Task Analysis
A-6 Conduct Literacy Task Analysis

(**Phase B: Design** and **Phase C: Development** are discussed elsewhere.)

A-1. Analysis work begins with conducting a needs analysis, where basic research is used to determine what occupations need to be analyzed and whether the performance problem is a training problem, a management problem, or something else.

A-2. Once the occupations to be analyzed have been determined, it is time to conduct a job (occupational) analysis to identify duties and tasks. You'll need to identify related information on: general knowledge and skills important to the job; worker behaviors (traits and attitudes); tools, equipment, supplies, and materials used by workers; and future trends and occupational concerns. This component requires high-quality facilitation and a team of 5-12 expert workers (top performers). (A number of occupational analysis approaches are available; one that has proven efficient, effective, and economical is the DACUM two-day workshop.)

A-3. Next is task verification. A large group (as many as 50-100) of expert workers (a) looks at the tasks identified in the previous component, (b) identifies any additional tasks, (c) ranks each task by its importance, and (d) ranks each task by how difficult it is to learn to perform it.

A-4. Selecting tasks for training involves summarizing and analyzing the data collected during task verification. Here is where decisions are made about which tasks students need training for, based on their importance and difficulty, and which tasks may be "deselected" or given low priority.

A-5. Here, a detailed task analysis is conducted on each task for which training will be provided. Task analysis not only involves systematically breaking down each task into steps but analyzing other important factors as well. These include (a) performance standards expected by industry, (b) required knowledge, attitudes, and safety, (c) decisions, cues, and errors involved, and (d) the tools, equipment, supplies, and materials needed to perform the task. It is important to specify the knowledge component in terms of the math, science, and language skills required of the expert workers. Gathering sufficiently detailed, accurate, and up-to-date information from industry experts here serves to practically eliminate the "what error" syndrome.

A-6. Finally, it is time to conduct a literacy task analysis. (This is optional and may be eliminated, if unnecessary.) Here the knowledge category is broken down as follows: (a) communication skills (reading, writing, speaking, listening), (b) mathematics skills, (c) science skills, (d) computer skills, and (e) decision-making skills (reasoning, problem solving). (The DACUM Enhanced Literacy Task Analysis [DELTA] process is an effective means of carrying out this step.)

Of course everything carried out in the design and development phases of the SCID and other instructional development models builds upon what is completed during analysis. It is easy to see that a well-conducted analysis not only will reduce or eliminate the "what errors" but will provide a solid basis for developing objectives, performance measures, learning guides, and other instructional materials. A well-conducted occupational analysis is an important step in delivering an excellent instructional program. Without it, curriculum "what errors" are almost certain to be present and the quality of the education or training program in serious doubt.

Remember, whether you are working in vocational-technical education or in business-industry training, you owe it to your students and trainees—as well as to taxpayers and employers—to provide the best, most relevant, up-to-date curriculum possible, so as to reduce—if not eliminate—serious and costly "what errors." The method described here has proven efficient and effective in serving this purpose.

For more information, contact Robert E. Norton, CETE/OSU, 1900 Kenny Rd, Columbus, OH 43210; (800) 848-4815.

USING DACUM FOR SKILLS CERTIFICATION IN SINGAPORE

The Institute of Technical Education (ITE) is the national authority for technical skills certification in Singapore. ITE is carrying out its responsibility—to develop and update skills standards to meet the needs of industry—using the DACUM method of occupational analysis. So far, over 130 skills standards have been developed, covering over 180 occupations or 23 percent of the skilled occupations listed in the Singapore Standard Occupational Classification.

The skills and the performance assessment criteria for various occupations are specified in the skills standards for those occupations. These standards form the basis for designing training and testing and often are used by employers as benchmarks for national certification to determine workers' skill levels.

ITE reviews and updates each skill standard every three to five years on a planned cycle, depending on the occupational area. In areas like electronics that experience rapid change, the reviews are more frequent.

The previous article is based on "How ITE develops and updates skills standards to meet the needs of industry" from a recent edition of The Quality Workforce, a publication of ITE.

DACUM

Some DACUM Uses

- ➢Curriculum development
- ➢Curriculum review and revision
- ➢Training needs assessments
- ➢Competency test development
- ➢Worker performance evaluations
- ➢Job descriptions
- ➢Process descriptions (ISO 9000)
- ➢Student recruitment
- ➢Student counseling
- ➢Student achievement records
- ➢Training program review
- ➢Curriculum articulation
- ➢Tech prep program development
- ➢Job modifications
- ➢Career development/planning

MAINTAINING DACUM QUALITY

It has been exciting to watch the expanding popularity of the DACUM occupational analysis process. Both in the United States and throughout the world, DACUM has found satisfied users among secondary and postsecondary educators, including Tech Prep and School to Work program developers, as well as among trainers in government, business, and industry. Much of the success can be attributed to trained facilitators, whose high standards and careful attention to procedures have contributed to the enhancement of thousands of educational and training programs.

It seems that the process is currently in wide use in the development of national standards. However, some users have gone so far afield as to have lost sight of the built-in quality standards of the true DACUM process. "Modified" DACUM is nothing new. In fact, we often have presented in the OPEN ENTRIES Newsletter descriptions of modifications that have been developed to suit special circumstances.

At a recent conference, however, this writer was somewhat shocked--and disappointed--to realize the extent to which the DACUM process was being modified--to its detriment. It turns out that numerous DACUM-style workshops are being facilitated by untrained facilitators and without much regard for the quality of either the process or the final product. Some of the procedures described were so far afield from recognized DACUM standards that they deserve a different name to describe them!

Among the "infractions" that turned up were (1) the unsuitable composition of "expert worker" committees, (2) lack of definitions or criteria for job tasks or task statements, (3) heavy dependence on outdated literature reviews, (4) lack of high-quality duty and task statements, and (5) the all-too-common failure to separate out worker behaviors, general knowledge and skills, and tool and equipment statements.

Far too often, task statements were unspecific and lacked appropriate qualifiers. For example, we cannot expect the instructor, curriculum designer, or other user to understand that task statements such as "develop a plan" and "maintain standards" mean "develop a floor plan" and "maintain sanitation standards." Nor can very different elements--worker behaviors, skill statements, tool and equipment standards--be mixed together with actual task statements and still yield a high-quality analysis and a solid foundation for curriculum development.

In an effort to address some serious concerns about maintaining the quality of this well-established process, we have developed a DACUM Quality Performance Criteria Checklist. Properly used, it can help facilitators (1) plan quality DACUM workshops, (2) evaluate both the process and products of these workshops, and (3) determine ways to improve both process and product to ensure that DACUM quality is maintained.

For more information on maintaining DACUM quality, contact Robert E. Norton, DACUM Program Director, CETE/OSU, 1900 Kenny Rd., Columbus, OH 43210; Phone (614) 292-4353 or (800) 848-4815, Ext. 4-7667; Fax (614) 292-1260.

DACUM Quality Performance Criteria

Criterion Statements	Yes	No	NA
For each criterion, indicate status as Yes, No, or NA			
1. The DACUM committee was structured as follows: a. A total of 5-12 expert workers were selected b. A majority of the experts were actual workers (rather than supervisors or managers) c. Committee members were geographically representative d. Minorities were proportionately represented e. Small, medium, and large size companies were fairly represented f. Members selected were able to participate during the entire analysis g. A working occupational title and definition was used to guide committee member selection			
2. The facilitator was qualified through training and practical, supervised experience in all aspects of the DACUM process.			
3. The facilitator was certified competent in the DACUM process by a recognized agency.			
4. The DACUM process used included: a. A formal orientation of the committee to the DACUM process. b. An initial brainstorming of the entire job/occupation. c. Development of an organizational chart. d. Identification of all the job/occupational duties (usually 6-12). e. Brainstorming of each duty to identify specific tasks. f. Identification of all job/occupational tasks (usually 75-125). g. Obtaining a clear consensus of the committee on all duties and tasks. h. Review and refinement of all the duties and tasks. i. Sequencing of all the duties and tasks. j. Identification of the general knowledge and skills. k. Identification of all important worker behaviors (attributes). l. Identification of the tools, equipment, supplies, and materials used. m. Identification of future trends/concerns likely to affect workers. n. Listing and defining all acronyms and any unusual terms used in the research chart. o. A review of and obtaining agreement on modifying the working occupational title, if appropriate.			

Criterion Statements	Yes	No	NA
5. The DACUM research chart produced contains **duty statements** which: a. Represent broad areas of work responsibility. b. Begin with a descriptive action verb. c. Contain an object (thing acted upon by worker). d. Contain a concise modifier (when appropriate).			
6. The DACUM research chart produced contains **job tasks** which: a. Represent the smallest unit of job activity with a meaningful outcome. b. Result in a product, service, or decision. c. Represent assignable/delegatable units of work. d. Have a definite beginning and ending point. e. Can be performed over a short period of time. f. Can be performed independent of other tasks. g. Consist of two or more steps.			
7. All of the DACUM research chart **task statements**: a. Began with a single precise action verb. b. Contain an object that receives the action. c. Contain a descriptive modifier. d. Are explicitly and concisely stated. e. Stand alone (are meaningful by themselves). f. Avoid references to knowledge needed. g. Avoid references to supportive worker behaviors. h. Avoid references to supportive tools and equipment. i. Are listed only once (unless the specific difference in two similar tasks was made clear).			
8. The DACUM research contains in addition to the duties and tasks the following: a. List of the general knowledge and skills required of workers b. List of the worker behaviors (personal traits and attributes) desired c. List of the tools, equipment, supplies and materials needed d. List of future trends/concerns e. List of acronyms and their definitions along with unusual terms (optional)			

Criterion Statements	Yes	No	NA
9. The DACUM research **chart** contains descriptive identification information including the: a. Agreed upon job/occupational title. b. Name of the developing organization. c. Name of the sponsoring organization. d. Names and affiliation of all committee members. e. Name and affiliation of the facilitator(s). f. Location of the workshop (city and state). g. Dates the workshop was conducted.			

Duty A—Market the DACUM Process

Task A-1. Present DACUM Concepts, Rationale, and Benefits A-1

Task A-2. Prepare DACUM Promotional Materials A-2

Task A-3. Establish Procedure for Providing DACUM Services A-3

Task A-4. Promote DACUM Services A-4

Task A-5. Consult with Potential DACUM Customers A-5

Task A-6. Assess Customer Need for DACUM A-6

Task A-7. Develop DACUM Services Agreement A-7

Resources:

The DACUM Connection Flyer A-9
Centergram Newsletter Segment A-11
Promotional Articles on DACUM A-13
The DACUM Process A-19
Sample Agreement Letter A-21
DACUM Workshop Agreement A-23

Task A-1. Present DACUM Concepts, Rationale, and Benefits

Before you will be able to accomplish very much using the DACUM process, you will need to clearly explain the key concepts of DACUM to your internal and external customers. They cannot support you if you cannot explain what DACUM is, how it works, the philosophy behind it, and its potential benefits. This is a critical task for every facilitator, whether you are employed by a business, educational agency, government or other type of agency, or are self-employed.

Explain why DACUM is better.

Often you receive only one opportunity to convince an internal or external customer that DACUM can help them, that it is the best way to proceed. In order to present the concepts of DACUM to others, you must first thoroughly understand them yourself. While all of the concepts needed are not presented in this Task A-1 section (to avoid unnecessary repetition), they are presented in this handbook. The prudent future facilitator will learn the concepts in order to be able to discussed them with anyone when the need arises. The DACUM concepts are not hard to sell or understand but some serious effort is required. (Perhaps the best way to become competent in the DACUM concepts and the overall process is to study this handbook thoroughly and to enroll in one of CETE's week-long DACUM Training Institutes.)

Your presentation of the DACUM concepts should include the following:

- Provide a brief definition
- Explain the DACUM philosophy
- Explain its major uses and applications
- Describe the two-day workshop process
- Name some of the major users
- Describe its many benefits and advantages
- Emphasize its effectiveness, the short-time required, and its low cost
- Explain the serious and very costly "what errors" problem
- Display some sample high quality DACUM Research Charts

Explain the most important DACUM concepts.

While you will not always need to present each of the concepts outlined, knowing about them will help you prepare to answer the questions that are likely to arise.

Task A-2. Prepare DACUM Promotional Materials

In order to inform potential customers of your DACUM services, you'll likely need some type of promotional materials. What you will want to prepare in the way of promotional materials will be determined to some extent by your employer (unless self-employed) and the role you are expected to fulfill within your agency, company, or other institution.

Many different types of materials can be used quite successfully:

- One- or two-page flyers
- Sample DACUM charts
- Standard business cards
- Brochures
- Advertisements
- Letters/memos
- Complimentary letters from satisfied customers
- Promotional campaign type buttons
- Promotional pens and pencils

Many types of promotional materials are available.

Which promotional items will work best for you is hard to predict. Your personal situation, including the budget available, will enter into this important decision. Once you have decided, prepare your material(s) in a professional manner. Make sure the questions of what, why, who, where, and when are clearly answered in a well-designed format, with good use of color, graphics, and white space.

Task A-3. Establish Procedure for Providing DACUM Services

Here, again, what you need to do will be determined to a large extent by your employer. Some of the many facilitators we have trained at CETE institutes indicate they are not expected to do any workshops except for the company or educational agency that employs them. Other facilitators report the opposite, doing little or nothing for their employer, but conducting many workshops for various external agencies.

If you are self-employed, you can do almost anything you want as long as it's legal and acceptable to your customers. Otherwise, you need to abide by your employer's existing procedures or establish new policies regarding such things as:

DACUM service policies.

a. What services will be offered?
  - workshop facilitation only
  - preparation of DACUM chart
  - verification services

b. How cost of services will be determined?
c. Type of agreement needed?
d. What approvals are needed?
e. How billing and payment will be handled?
f. Whether consulting time can be used by the facilitator?
g. Where workshops can be conducted, what facilities are available, and what is the geographic area of interest?

The specifics of these procedures are highly individual. The main concern is that you have a clear understanding in advance of what is desired by or, at the very least, acceptable to your employer.

Task A-4. Promote DACUM Services

As a newly trained DACUM facilitator, you will probably want and need to promote the availability of your facilitation skills and services. Trainers and educators cannot request your services if they do not know you exist or possess the desired skills (awareness precedes choice).

Awareness precedes choice.

At CETE, we are constantly promoting our DACUM training services. See pages A-9 to A-10 for a copy of "The DACUM Connection" Flyer which is used primarily to promote our DACUM Facilitator Training Institutes but which also describes our DACUM workshops and SCID curriculum development workshops. It is suitable for mailing, faxing, and handouts and is easy to update. We also advertise our DACUM Institutes and SCID curriculum workshops regularly in the Centergram (see page A-11 to A-12 for segment of one issue).

The DACUM Connection

The "DACUM Connection" section of the OPEN ENTRIES Newsletter was used also to promote DACUM generally, by publishing in each issue one or more articles featuring various business, educational, and governmental use of the DACUM process (see pages A-13 to A-17 for some examples). You may want to do something similar in a local or regional newsletter or newspaper.

DACUM articles

Another method CETE has used quite effectively is a one-page graphic flyer (see page A-19). It is easy to produce, low cost, and easy to mail, fax, or hand out at meetings.

Graphic flyer

Many facilitators make excellent use of sample DACUM charts for jobs/occupations that they previously facilitated. The old expressions of "show me" and "seeing is believing" seem especially true in this case. A professional looking, attractively designed chart can make quite an impression (see Appendix A). It is even more impressive if the work was done for a well-known company or a respected agency.

Even the best materials are not useful unless people see them. You must get your materials distributed. You will probably want to use one or more mailing lists as well as make appropriate distribution at professional meetings, workshops, and conferences. Some facilitators have joined their local chapter of the American Society for Training and Development (ASTD) and/or National Society for Performance and Instruction (NSPI) for the purpose of making business contacts and networking with prospective customers.

Network with ASTD and NSPI members.

Finally, the best and lowest cost promotion for your services comes from consistently providing high-quality services for a reasonable price. This will result in satisfied clients who will in turn tell others about your valuable services.

The best promotion comes from providing high-quality service.

Task A-5. Consult with Potential DACUM Customers

The need to consult with potential DACUM customers will probably arise from two quite different situations: (1) responding to people who contact you for more information about DACUM, and (2) contacting persons and organizations whom you believe have a potential for wanting and needing your DACUM services.

In the first instance, you need to quickly determine what type of information and/or materials are desired, and then promptly provide the information by phone, fax, e-mail, or regular mail. Be sure to answer their question clearly and completely. And, of course, to the extent possible, ascertain the potential customer's readiness for your DACUM services.

Promptly respond to requests.

In the second situation, it may pay you big dividends to make either in-person or phone contacts with persons and agencies that exhibit high potential for needing DACUM services. Your networking with ASTD, NSPI, and members of similar organizations can provide some solid leads. Once you have identified good prospects, you need to promptly follow up,and consult with them about how you and DACUM can help them set up a new training program curriculum, meet ADA and ISO 9000 standards, etc.

Task A-6. Assess Customer Need for DACUM

This may at first appear to be a simple matter. But extensive experience has shown that assessment of the customer's need for DACUM is a pretty significant task. Often your potential customer has only heard about DACUM but knows very little about what the process can do. As the potential consultant who wants to be successful in providing high-quality DACUM services, it's to your benefit as well to make sure DACUM can help.

Assess your customer's needs carefully.

When the customer's need is not explicitly clear, you need to ask him/her to explain the situation or problem. Follow up the customer's presentation with probing questions, if necessary, to clarify the situation and the real need(s). In many cases and with many types of agencies, DACUM can be of help. But remember, it pays to be honest—with yourself and your customer. Don't oversell DACUM—it can do a lot effectively, quickly, and at low cost, but it can't do everything.

Task A-7. Develop DACUM Service Agreement

The DACUM service agreement will range from the very informal, unwritten agreement to conduct a DACUM within a company, educational agency, or government organization, to a very formal type of contractual agreement that has to be signed in

Obtain the correct type of DACUM service agreement for your agency.

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multiple copies by representatives of both parties. The first thing a facilitator should do, if it's not already known, is to find out exactly what the accepted practice is for his/her employer. You may find that the customer, especially an external one, has different requirements.

Generally speaking, the simpler the agreement, the better it is for all involved. It is recommended that the facilitator prepare a letter type of proposal that describes the specific services to be provided and the total costs involved. The letter or other type of agreement should always specify the following:

- Proposed workshop dates
- Proposed workshop location
- Job or occupation to be analyzed
- Number of expert workers to be recruited
- Description of media requirements
- Supply requirements (e.g., lecture pad paper, 5" x 8" cards, 8½" x 11" card stock, felt-tip markers in black, red, and blue, and hold-it putty)
- Who will serve as recorder
- Requirements for continental breakfast, lunch, and refreshments
- Possible parking permits
- Information to be shared with committee members before workshop - DACUM information, map, and sample agenda
- What the customer will receive in the way of resulting DACUM chart(s)
- Total cost of the services to be provided

A sample agreement letter commonly used by the Center for this purpose is contained on page A-21. To obtain formal approval of the proposed arrangements, it is recommended that an appropriate official in the sponsoring organization be asked to signify acceptance by signing and returning the DACUM Workshop Agreement. See pages A-23 for a sample agreement.

The DACUM *Connection*

Make DACUM Quality Work for You!

As a manager or developer of occupational training programs, you've got to know exactly what happens at the work site. **DACUM** makes that connection for you.

The **DACUM** process for occupational analysis involves expert workers-the local men and women with reputations for being "the best" at their jobs. These workers tell us what they do and how they do it. Their descriptions are in the language of the occupation. That means we get the straight story from the people on the job, the ones who know. In turn, your instructors and administrators get information that's hard to come by. And when the process is completed, you've got a complete **DACUM** chart-a graphic profile of the tasks required in an occupation developed by experts workers in the occupation.

Strengths of DACUM Process

Users report the following major advantages of the **DACUM** process:

- provides solid foundation for program development or revision
- maximizes worker input and buy-in
- it's efficient-2 days instead of weeks
- identifies all the critical tasks
- strengthens BIL linkages and support

A **DACUM** chart can then be used as a basis for-

- curriculum development/revision
- school-to-work connections
- tech-prep program development
- meeting ISO 9000 and TQM standards
- training needs assessment
- worker performance evaluations
- competency test development
- trainee achievement records
- fostering BIL and education linkages

LEARN HOW TO AVOID THE SERIOUS AND COSTLY CURRICULUM WHAT ERRORS

1. Failure to teach WHAT should be taught (the latest concepts and methods)
2. Teaching WHAT should not be taught (outdated concepts, and processes)

These "What errors" cheat your students/ trainees and the taxpayer/company. DACUM is a quick, low cost, and very effective process for significantly reducing these errors.

DACUM Training Institutes

December 9-13	**Cincinnati, OH** Hosted by Great Oaks Institute of Technology
January 20-24	Host Pending
February 3-7	**Columbus, OH** Hosted by CETE/OSU
March 3-7	Host Pending
April 7-11	**Columbus, OH** Hosted by CETE/OSU

(Registration fee is $995)

Selected Industrial Clients

- General Motors
- General Electric
- Motorola, Inc.
- Virginia Power
- Champion International
- Newport News Shipbuilding
- Eastman Kodak
- UAW-Ford
- Arthur Anderson
- Ashland Chemical
- Control Data
- Blue Cross/Blue Shield
- United Airlines
- AT&T
- Navistar International
- Defense Supply Centers
- Discover Card Financial Services
- Monsanto Chemical
- Dofasco, Inc.
- Unilever
- Ericsson Inc.

Selected Educational Clients

- Brevard Community College
- Columbus State Community College
- Dallas County Community College
- DeVry, Incorporated
- Ferris State University
- Houston Community College
- Johnson and Wales University
- Madison Area Technical College
- Memphis City Schools
- Niagara College
- San Antonio Community College
- St. Clair College of Applied Arts
- Valencia Community College

Selected Government Clients

- Ohio Bureau of Employment Services
- Ohio Department of Education
- Tennessee Department of Education
- Texas Higher Educ. Coordinating Board
- U.S. Defense Supply Construction Ctrs.
- U.S. Army/Navy
- Wisconsin Dept. of Workforce Dev.

Who Should Attend?

The DACUM Training Institute is designed for program or course designers, training coordinators, trainers, curriculum specialists, educational specialists, and staff or human resource development specialists.

CENTER ON EDUCATION AND TRAINING FOR EMPLOYMENT
COLLEGE OF EDUCATION
THE OHIO STATE UNIVERSITY

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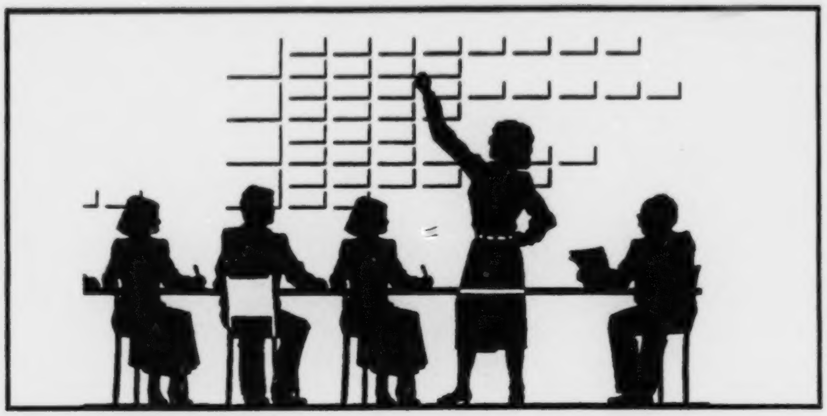
Benefits of the Institute

The week-long training institute is designed to prepare you as a DACUM facilitator. You will-

- **learn key elements of the DACUM process**-when and how to use DACUM effectively
- **acquire facilitation skills**-how to obtain panel comments and clarify panelists' statements with probing techniques
- **obtain practice**-use the DACUM process to analyze a real job and receive systematic evaluation from a trained facilitator
- **receive a Certificate of Completion**-recognizes you as having completed DACUM facilitator training.



DACUM-Related Services

Are YOU interested in learning how to use the results of DACUM to develop curriculum materials and training programs successfully both in education and training settings? Because the DACUM process, when correctly implemented has proven to be a reliable and efficient method for competency identification, the Center offers a variety of DACUM-related services supporting and including, the development of curriculum materials.

The Center offers its services to conduct workshops on SCID (Systematic Curriculum and Instructional Development), task verification, standard task analysis, performance standards, and various other aspects of curriculum development, once the job performance requirements have been defined by DACUM or other means.

What Do DACUM Services Cost?

The registration fee for participation in the weeklong **DACUM** Institute is $995. The cost of an on-site **DACUM Job Analysis** is $2,000, plus the facilitator's travel and per diem costs. The cost of a week-long DACUM Training Institute program is based on the number of people you wish to have trained. For example, the cost to train 3 people is $4,500, plus the instructor's travel and per diem costs.

The cost of a Curriculum Development workshop is based on the instructor's fee, number of participants, travel, and per diem costs, plus the cost of instructional materials.

Interested in the DACUM Job Analysis Process?

For a sample DACUM chart and other information on the DACUM Job Analysis Process, please write/call Bob Norton at (800) 848-4815 or (614) 292-4353, Ext. 4-7667, or Debbie Weaver, Ext. 4-7682. Bob or Debbie will be happy to answer all your questions and send you information.

For information about SCID (Systematic Curriculum Instructional Development) workshops, please call Bob Norton at the same numbers.

DACUM REGISTRATION FORM

Name ______________________________

Position ______________________________

Company ______________________________

Business Address ______________________________

____

City ______________________________

Phone # (   ) ______________________________

Fax # (   ) ______________________________

_____ Check enclosed in the amount of $ _____________ made payable to the Center on Education and Training for Employment at The Ohio State University.

Date of workshop applying for: ____________________

_____ Purchase Order # ____________________

_____ Please charge to my credit card:

_____ MasterCard _____ VISA   Expir. Date ________

Account # ______________________________

Signature ______________________________

Name on Card ______________________________

Mail or fax your request to:
Dr. Robert E. Norton
Center on Education and Training for Employment
The Ohio State University
1900 Kenny Road
Columbus, OH 43210-1090
FAX: 614-292-1260

The DACUM Connection

The DACUM occupational analysis process is unique in that the tasks of any job/occupation are identified in a single, ***intensive*** two-day workshop. The small group of workshop participants (5-12 persons) are individuals identified as expert workers in the occupation—those considered best able to identify what a skilled worker needs to be able to do in order to be successful. A trained facilitator leads the process.

Since the 1970s, CETE has been promoting and refining the DACUM occupational analysis process, conducting DACUM analyses for various clients, and—perhaps most important—training others to conduct these analyses through its DACUM Training Institutes. To date, more than 1,000 DACUM facilitators from over 20 countries have been trained and certified.

Clients have included secondary schools, public and private two-year postsecondary schools and colleges, four-year colleges and universities, government agencies, and such diverse businesses and industries as General Motors, Ford, General Electric, Motorola, Virginia Power, American Electric Power, Newport News Shipbuilding, Eastman Kodak, Monsanto Chemical, AT&T, United Airlines, Discover Card Financial Services, and John Deere.

Does the process work? Here's what some experienced DACUM facilitators from industry and education have to say:

> The DACUM process, applied correctly and with care, could change our nation as teachers, administrators, technicians, product developers, personnel staff, trainers, and others learn to apply it in making themselves, their jobs, and their organizations smoothly run, cost-effective, and customer-responsive.
>
> *Linda Randolph, Director T.H. III Programs,*
> *Pellissippi State Technical Community College*

> DACUM is the most cost-effective and efficient analysis tool I have ever worked with. It's amazing that something so fast and easy can be so powerful.
>
> *Guy Grindborg, Human Resources Competence Manager*
> *Ericsson Inc. Radio Systems*

Users, in general, report the following major advantages of the DACUM occupational analysis process:

- Provides a solid foundation for program development or revision
- Maximizes worker input and buy-in
- Is efficient, taking two days instead of weeks or months
- Identifies all critical tasks
- Strengthens business-industry-labor linkages and support

The product of the DACUM process is the DACUM research chart, a graphic profile of the tasks required in an occupation, clustered into duty areas. The DACUM chart can be used as the basis for activities such as the following:

- Curriculum development/revision
- School-to-work connections
- Tech-Prep program development
- Meeting of ISO 9000 and TQM standards
- Training needs assessment
- Worker performance evaluations
- Competency test development
- Trainee achievement records
- Fostering of linkages between business-industry-labor and education

In recent years, CETE staff have been doing fewer job-specific analyses and more occupational analyses covering multiple related jobs. With the advent of ISO 9000 and QS 9000, the conduct of process analysis, focusing on individuals with multiple job titles who work together as a team, has become important to many companies. Likewise, state workforce development agencies have requested functional analyses, usually focusing on major agency units rather than specific jobs or occupations.

DACUM Training Institutes

The five-day DACUM Training Institutes are designed for program or course designers, training coordinators, trainers, curriculum specialists, educational specialists, and staff or human resource development specialists. The training provided gives participants the knowledge, hands-on practice, and skills they need to become certified DACUM facilitators able to conduct their own occupational analyses. The ***registration fee*** for each Institute is $995. Upcoming institutes are planned for the following dates and locations:

When:	December 9-13, 1996
Where:	Cincinnati, Ohio
Host:	Great Oaks Institute of Technology
When:	February 3-7, 1997
Where:	Columbus, Ohio
Host:	CETE/OSU
When:	April 7-11, 1997
Where:	Columbus, Ohio
Host:	CETE/OSU

Many DACUM Training Institutes are conducted at the request of community colleges, state agencies, and businesses/industries. These are typically held at the requestor's location, which is usually more economical if six or more individuals are to be trained.

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DACUM Invitational Seminar

This two-day seminar is designed to provide a forum for ***experienced*** DACUM facilitators to share their experiences and their innovative ideas and techniques for using the DACUM occupational analysis process. Presenters will represent both education and business/industry. The ***registration fee*** for the seminar is $195.

When: December 3-4, 1996
Where: Cincinnati, Ohio
Host: Great Oaks Institute of Technology

For a sample DACUM chart or information on these scheduled DACUM activities, please contact (or leave a voice mail message for) Bob Norton at ext. 4-7667, or Debbie Weaver, ext. 4-7682. Note that all CETE workshops are offered on a cost-recovery basis and are subject to cancellation should there be insufficient registrations.

Dofasco Inc.—located in Hamilton, Ontario, and one of Canada's largest producer of flat rolled steel products—has used the DACUM job analysis process to analyze over 150 critical jobs in five business units and several business areas. According to their Technical Trades Training Staff—

> The implementation of this process helped create instant "buy-in" by the employees due to the high employee involvement. It also enabled us to build performance measures that are in fact measurable.... Employees now have a good understanding of how they will be measured and what competencies are required, and yearly training plans are easily developed and more effective. The DACUM profiles [charts] are living documents that are reviewed regularly and stay current with changes in the job processes or technology.
>
> The DACUM profiles serve as a good starting point for the development of training curriculums, but their versatility allows for much greater use. At Dofasco, the information that is being collected is used by employees—in conjunction with supervision—to develop job performance standards, standard operating practices, and job aids, all of which are necessary to ensure consistent, high-quality products and services for our customers—an essential element in today's highly competitive global market.

Building on DACUM: The SCID Approach

The DACUM occupational analysis process describes ***what*** should be taught. It is just one step in the overall instructional systems design process. The SCID process—Systematic Curriculum and Instructional Development—looks at the total process and focuses specifically on how you can use the results of a DACUM analysis to build a defensible curriculum linked to the needs of the occupation and the students being trained.

The five-day SCID Workshops offered by CETE cover competencies in five phases. Workshop activities include large-group presentations, small-group discussions, and individual hands-on practical exercises and activities. The ***registration fee*** for each workshop is $795. Upcoming workshops are planned for the following dates and locations:

When: November 11-15, 1996
Where: Dallas, Texas
Host: Dallas County Community College District

When: January 13-17, 1997
Where: Columbus, Ohio
Host: CETE/OSU

For information on these scheduled SCID activities, please contact (or leave a voice mail message for) Bob Norton at ext. 4-7667, or Debbie Weaver, ext. 4-7682. Note that all CETE workshops are offered on a cost-recovery basis and are subject to cancellation should there be insufficient registrations.

Phase I: Curriculum Analysis

√ Conduct needs analysis
√ Conduct task verification
√ Select tasks for training
√ Conduct standard task analysis
√ Conduct functional literacy task analysis

Phase II: Curriculum Design

√ Determine appropriate training approach
√ Develop learning objectives
√ Develop performance measures
√ Develop a training program plan

Phase III: Instructional Development

√ Develop a competency profile (competency-based option) or curriculum guide (conventional option)
√ Develop learning guides/modules (competency-based option) or lesson plans (conventional option)
√ Develop supportive media
√ Pilot-test/revise instructional materials

Phase IV: Program Implementation

√ Implement training plan
√ Conduct training
√ Conduct formative evaluation
√ Document training

Phase V: Program Evaluation

√ Conduct summative evaluation
√ Analyze information collected
√ Initiate corrective actions

May 1993

the
DACUM
connection

DACUM GOES GLOBAL

The aplication of DACUM knows no boundaries. In the last few years, groups from Chile, China, the Dominican Republic, Korea, Kuwait Malaysia, New Zealand, Pakistan, Singapore, Sri Lanka, and Turkey have come to the Center in Columbus for training. In addition, Center staff have taken DACUM training to sites in Canada, Chile, Indonesia, Kuwait, New Zealand, the Philippines, Singapore, and Venezuela. New requests come regularly.

It seems that word is spreading that the DACUM process works well with any job or occupational area in any geographical area. With only two prerequisites required to guarantee a high-quality DACUM analysis, the process is relatively simple to implement. A trained facilitator is needed to guide the process, and a panel of five to twelve expert workers (top performers) must be available to provide input.

International companies, including Motorola and Emery Worldwide, have taken the DACUM process abroad. Its usefulness in analyzing jobs at all levels—semiskilled, skilled, technical, supervisory, managerial, and professional—makes it ideal for almost any industrial or educational operation anywhere. No matter where it has been employed, DACUM has proven to be an effective and economical method of quickly determining what tasks are performed by the most successful workers.

The applications have been as wide ranging as the locations. In Singapore, the National Institute of Technical Education, which plans and conducts all vocational and technical education nationwide, is the principal user. In Venezuela, the process initially was used to analyze the jobs of vocational teachers and administrators. The latest plans in that country call for expanded use at the skilled and technical levels by secondary and postsecondary institutions as well as with oil, electric, aluminum, and other companies for employee training.

In different parts of the world, the DACUM process is being used—as it is in this country—for a wide variety of uses, including curriculum development, review, revision, and articulation; training needs assessments; competency test development; worker performance evaluations; student recruitment, counseling, and recordkeeping; training program review; Tech Prep and career program development; and job descriptions and modifications.

Ways to make DACUM work may only be limited by the imagination of talented and dedicated facilitators at home and around the globe. To find out how you can put DACUM to work for you, contact *Dr. Robert E. Norton, Center on Education and Training for Employment, The Ohio State University, 1900 Kenny Rd., Columbus, OH 43210-1090; (800) 848-4815.*

DACUM: "A PROCESS WE RELY ON"

Among the many contributions of education to indus-try, one that seems to be gaining recognition is the DACUM process. The number of industrial clients all across the nation is growing rapidly as word spreads about the efficiency and effectiveness of theDACUM job analysis and curriculum development process.

The list of clients is growing all the time. "Satisfied customers" include American Welding Society, Arthur Anderson, Ashland Chemical, AT&T, Blue Cross/Blue Shield of Florida, Champion International, Control Data Corp., Defense Supply Centers, Eastman Kodak, Emery Worldwide, General Motors, General Electric, Monsanto, Motorola, Inc., Newport News Shipbuilding, Samsung, UAW-Ford, United Airlines, U.S. Government Printing Office, Virginia Power, and many others.

With so many positive reactions, a clear picture begins to emerge.

On saving time and money:

"Doing this process saved many hours of course developers' time and effort. In addition, the duties and tasks were developed among the SME attendees and will build Course Development's confidence that an accurate view of what

(continued)

Reprinted from *OPEN ENTRIES* Vol. 12, No. 4, May 1993. Center on Education and Training for Employment, The Ohio State University

needs to be developed is now well underway. This process is highly recommended for any future product requiring a job analysis . . . . The competency profile of the CDRP administrator technician is an extremely useful document. Were it not for DACUM, which captured information on duties and tasks, the process would have taken much more time and money."

On strengths of the workshop:

"The professionalism of the facilitators. They were objective, and truly facilitated the group's work. The DACUM developer who worked with our group was the most expert facilitator I've ever seen!"

"The synergy of the group. None of us could have done this alone."

"Interactions between individuals. The top-down view provided a different perspective."

"All types of people together discussing use-processes. It has rarely been done before."

"Making everyone take a different (user) view of the system as a whole."

On strengths of the process:

"Solid foundation for development; efficient—two days versus six weeks; specific versus general job specifications; employee involvement and buy-in; use of expert panel members; identification of critical tasks; opportunities for sharing ideas."

"A productive way to get information for course developers, a real learning experience for us developers."

"It appears to be a powerful way of getting a large amount of information broken down into duties and tasks in a quick manner."

"It was interesting to see the structure emerge from a chaotic background."

Versatility seems to be one of DACUM's greatest strengths. No matter what the area under consideration, the process seems to yield results and gain enthusiasts. Participants at one DACUM workshop included machinists, who noted they were "able to reach consensus about important trade skills"; travel agents, who found the experience "most impressive"; police officers, who discovered an "excellent way to inform potential recruits of police duties"; paramedics, who thought it was "important to involve persons actually working in the field"; and recreation and parks workers, who thought the approach was "extremely practical."

On follow up:

"Thanks for keeping us in mind as you advance the state of the art in the development of curricula and programs. Thanks also for the update on DACUM. It is still a process we rely on."

the
DACUM
connection

SCID: "AN IMPRESSIVE MODEL . . ."

The newer Systematic Curriculum and Instructional Development (SCID) workshops also are bringing satisfaction to the "converted"—DACUM supporters—as well as to new users from industry and education. The SCID workshops seem to be filling a significant need for tailor-made instructional materials and are getting "rave reviews."

On the workshop and content:

"This workshop has given me a foundation on which to build my program—every aspect was valuable to me."

"An extraordinary, progressive workshop—all facets. Great presentations on SCID and workplace literacy."

"The notebook was a great resource filled with good documents and examples."

"The learning guide and all the resource materials are greatly appreciated."

"I appreciate the facilitator's extra time spent discussing samples, examples, and resources."

"One of the best workshops I ever attended. I attribute this to clear communication strategies (pre-workshop—I knew what to expect) and in-session strategies; terrific organization (schedule and transportation); and great delivery and deliverers."

"An impressive model, and the instruction and materials support each phase. Organizing the process in a visual context makes it easy to explain the training process to management and trainers."

"A very relaxing learning environment was conducive to the generation of new ideas."

On the participants:

"The 'mix' of attendees—friends, now—was great."

"The combination of business and education participants greatly enhanced the quality of the workshop."

"Created an opportunity to network with other training professionals."

"A great group of participants who willingly contributed and shared their experiences."

On meeting participants' professional objectives:

"My objective was to be able to apply a systematic approach to developing training. My objective was met in terms of obtaining the knowledge to do so."

"Excellent workshop. I'll be able to apply what I learned immediately."

"Helped me to evaluate my own work in terms of curriculum design and instructional design of supporting materials. It has given me more direction and focus in my work and provided me with excellent formulas and examples for the written material."

"I wanted to learn more about competency-based curriculum and round out my knowledge of the whole process from job analysis on. This program provided that information."

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the DACUM connection

DALLAS-STYLE DACUM

NOW THAT the Texas Higher Education Coordinating Board requires direct business and industry input into new and revised curricula, use of the DACUM process has become more widespread than ever across the state. Dallas County Community College District (DCCCD) is happy to have gotten on the DACUM bandwagon early. Those who have participated on DCCCD DACUM panels say the approach strikes a responsive, real-world chord. It benefits the students in the programs evaluated, the businesses that ultimately employ them, and the institutions that use the reviews to keep their curricula current and relevant.

One Dallas business owner says DACUM is a way of making sure colleges don't produce "educational Edsels." Some educators call it a way to ensure competency-based training, while others see it as a systematic "spin" on job analysis techniques that industry and the military have been using for years. All are correct in their descriptions of this pragmatic review process that has been gaining advocates in the DCCCD and in other education and training settings across the country and around the world.

The basic premise behind DACUM is simple: If you want to train workers to do a specific job well, ask those who have done it successfully how they did it. Still, the process is new to many business, industry, and educational training organizations.

Typically, completion of a DCCCD DACUM involving 10 to 15 professionals in a given occupation produces a DACUM chart, a kind of blueprint for facilitating instructional design. Copies of the chart are sent to employers in the field for a "reality check" and to DCCCD faculty to make sure courses incorporate needed skills training. DCCCD staff believe that their version of the DACUM process has improved with age. This has come about largely because instructors in the programs being evaluated take the lead role in selecting occupations to be scrutinized and recruiting panelists. In the past 10 years more than 40 job areas have been analyzed—from Legal Assistant to Vocational Nurse.

A participant in a recent DACUM on Assistant Food Service/Restaurant Manager admits to having been skeptical at the beginning. But, he said, the panel gave a lot of good information and useful recommendations—some he plans to act on in his own place of business, like increasing the use of computers in several areas of the job.

Professionals who have participated in the DCCCD DACUM analysis sessions feel that beside bringing their own expertise to the table, they gain something valuable: professional growth and revitalization. One participant in the Legal Assistant analysis said the DACUM session was one of very few vehicles for sharing personal experiences with other professionals: "One gains vicariously from others and walks away with a better understanding from hearing about the experiences of peers."

For more information about DCCCD DACUM activities, contact *Margot Hirsch, District Director for Quality in Planning, Dallas County Community College District, 701 Elm St., Dallas, TX 75202; (214) 746-2451.*

FULL CIRCLE TRAINING

TOO OFTEN company training programs target only managers; however, Yellow Freight System, Inc., is focusing its most recent training development effort on those employees in closest contact with its customers' freight: the dock workers and their supervisors. (City drivers will be the next group scheduled for training.) Using the DACUM process, Yellow instructional program developer Dan Mathias wanted to ask dock employees to articulate and agree upon what they do and how they do it.

Last October, 10 dock workers met for several days to describe the work they did on the dock and to draft a list of duties and tasks. The list was sent to 100 dock workers and 100 supervisors to rate the importance of each task and whether training for it was required. The workers named the program "Full Circle Training—training that begins and ends with our people."

Experienced dock workers who participated in the DACUM analysis are pleased about the program because in the past there were no company standards for loading freight. They could see the consequences every day, since a badly loaded trailer takes more time and extra work to unload. According to one dock worker, "It gives you a bad attitude if you open a trailer that's loaded poorly. You think, well, if they don't care, why should I?" Since the training is planned for everyone, not just new employees, the hope is that all will "take more pride in their job and do it right."

After several months the original group of 10 reconvened with training staff members to put the finishing touches on the training—refining, standardizing, and making final recommendations. Besides content, they discussed the types of instructional materials and training methods they would like to see developed and used for the program. Said one of the participants, "If we're going to differentiate ourselves from our competition, we need to do things like this."

For more information on this industrial application of the DACUM process, contact *Dan Mathias, Instructional Program Developer, Yellow Freight System, Inc., 10990 Roe Ave., Overland Park, KS 66211; (913) 345-3000.*

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DACUM at Dofasco

THE BIG QUESTION that surfaced at Dofasco Inc., as new employees were hired to replace experienced workers, was "What do we teach them?"

Dofasco Inc, located in Hamilton, Ontario, on the western shores of Lake Ontario, is one of Canada's largest producers of flat rolled steel products. The company was founded in 1912. Recently, like many of its counterparts in the United States, the company went through a major restructuring and downsizing program, effecting a reduction in the work force from 12,000 to 7,000 employees.

As experienced senior employees left the company through early retirement or with severance packages, less experienced workers were expected to take over their responsibilities. That meant training. And as the trainers began designing programs, the "big question" arose.

In seeking an answer to this all-important question, the Dofasco Technical Trades Training (TTT) staff decided they would need to produce a detailed job and task analysis for each job. The method they elected to use was the DACUM process.

To begin the process, the TTT staff prioritized the jobs from high to low and spent two days using DACUM to capture the major areas of responsibility (duties and tasks) for each. Each job was then mapped out and each task was weighted according to frequency, criticality, and learning difficulty. Using this system in conjunction with the Pareto analysis (weighting of selected economic factors), the staff was able to focus on further breaking out critical tasks and developing training for the vital areas in each job. This systematic approach provided consistency and focus. Once the job was defined and rated by the expert workers, many of the existing assumptions were replaced with facts, and the answer to the "big question" became clearer.

High employee involvement during the implementation of this process helped create instant "buy-in." It also enabled the TTT staff to build measurements of performance that are in fact measurable. Additionally, the information gathered through the process com-plements Dofasco's quality and pay for skills and knowledge programs.

The DACUM profiles serve as a good starting point for the development of training curriculums, but their versatility allows for other uses as well. At Dofasco, the information that is being collected is used to develop job performance standards, standard operating procedures, and job aids, all of which are needed to insure the consistent, high-quality products and services essential to compete in today's global market.

After training, employees have a good understanding of how their performance will be measured and what competencies are required. For TTT staff, yearly training plans are easily developed and more effective. The profiles are living documents that are reviewed regularly and kept current with changes in the process or technology.

For more information on DACUMs at Dofasco, contact *Krystyna McLennan, Technical Trades Training staff, Dofasco, Inc., P.O. Box 2460, Hamilton, Ontario, L8N 3J5; (800) 363-2726, Ext. 7105.*

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DEVELOPING TRAINING FOR A NEW MACHINE

IN SEPTEMBER 1991 Champion International Corporation announced an expansion at its mill in Courtland, Alabama. A paper machine, #35 Process, was scheduled to start up in August 1993, a process that would involve a projected 600 job moves when operators transferred to the new machine. And for the expansion to be a success, the existing mill needed to maintain or increase production.

Development of training materials began almost immediately and was to last nine months. The DACUM job analysis process was applied in 14 areas of paper manufacturing, using a cross-section of machine crews for one week per area to identify the tasks for each job. This group plus additional operators from each area of expertise did the task analyses. Over 1,200 tasks were analyzed, edited, and word processed in a five-month period in preparation for lesson-plan development.

In March 1992, 19 operators selected from different areas of the mill attended on-site Train-the-Trainer classes. After these classes, they developed learning materials for the training: lesson plans based on the task analyses, small-group exercises, flow diagrams, overheads, videos, and slide presentations.

For the next three months, to support the movement of operators to the expansion project, some workers were trained one job up, and new employees were trained. In all, more than 300 operators received 40 hours of classroom training.

With the initial phase of training for existing areas completed, work started on planning materials and instruction for #35 Process. A dozen operators were selected to write 50 learning guides, assist with additional materials from outside sources, and conduct the training.

Learning guide development started with a conceptual DACUM based on the existing areas of paper manufacturing. Over 300 tasks were identified and reanalyzed to fit the new machine. The task analyses would become activity sheets in the learning guides. Other components of the guides were directions for use, a purpose/performance objective, learning steps, illustrated information sheets, knowledge checks, and on-the-job skill checks. Written drafts were reviewed, edited, and printed; any needed revisions were made as the guides were used.

The same approach was used for the #35 Process as for existing areas—Train-the Trainer classes, lesson-plan and teaching aid development, etc. In January 1993 actual instruction for the #35 Process began. The program was conducted in five phases, with the primary focus being the job an operator would be responsible for at start-up. Job-specific tasks were identified and charted using a Job/Task matrix showing the relationship of each task to the job. Each operator underwent 800 hours of instruction, including 100 hours of social training covering a dozen topics, for example, changing paradigms, situational leadership, and interest-based problem solving.

It was no surprise that start-up of the #35 Process occurred right on schedule and was a big success. Thanks to careful preparation and the dedication of all involved, #35 Process was up and running, and August 1993 was a record production month.

Following is a summary of the major events during the 22- month period between the initial announcement and start-up.

- 14 DACUM workshops conducted on paper manufacturing
- 1,500+ tasks identified and analyzed
- 1,100 job moves
- Countless lesson plans written
- 300+ operators receive 40 hours of classroom training
- 130 operators/mechanics receive 800 hours of #35 Process training
- Production records broken seven times
- Process established for ongoing training as basis for continuous improvement.

For more information on how Champion International uses DACUM job and task analysis to expedite training, *write or call David La Bonte, Manager, Training and Communications, Champion International Corporation, County Road 150, Courtland, AL 35618; (205) 637-5684.*

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November 1994

The DACUM Process

DEFINITION

DACUM (day-kum)

- an abbreviation for **D**eveloping **A** **Cu**rricul**um**
- an occupational analysis performed by expert workers in the occupation
- an occupational skill profile which can be used for instructional program planning, curriculum development, training materials development, organizational restructuring, employee recruitment, training needs assessment, meeting ISO 9000 standards, career counseling, job descriptions, competency test development, and other purposes.

PHILOSOPHY

The DACUM philosophy states that:

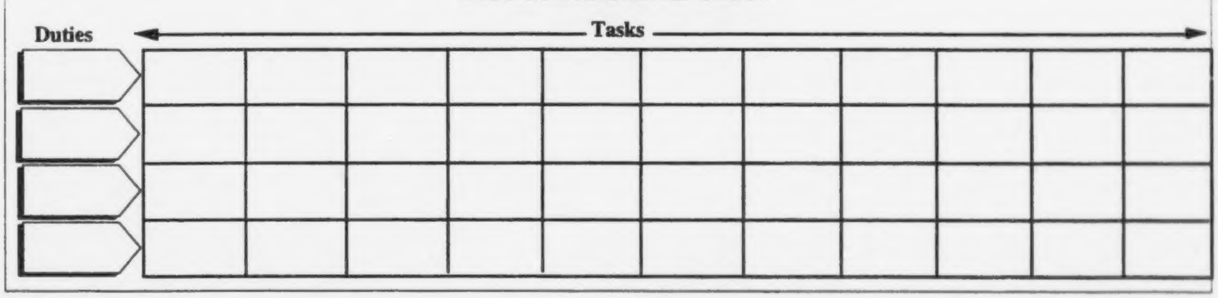
- expert workers are better able than anyone else to describe their occupation
- an occupation can be described effectively in terms of the tasks successful workers perform
- successful task performance is directly related to the knowledge, skills, tools, and attitudes that workers must possess to perform the tasks correctly.

The DACUM process for occupational analysis involves local men and women with reputations for being the "top performers" at their jobs, working on a short-term committee assignment with a qualified DACUM facilitator. Workers are recruited directly from business and industry. These workers become the Panel of Experts who collectively and cooperatively describe the occupation in the language of the occupation.

The Panel works under the guidance of a trained facilitator for two days to develop the DACUM Research Chart. The chart contains a list of general areas of competence called *DUTIES* and several *TASKS* for each duty. Brainstorming techniques are used to obtain the collective expertise and consensus of the committee. As the Panel determines each task, it is written on a card. The cards are attached to the wall in front of the Panel. The completed chart is a graphic profile of the duties and tasks performed by successful workers in the occupation.

The Panel also identifies the general knowledge and skills required of successful workers, the tools, equipment, supplies, and materials used, the important worker behaviors essential for success, and the future trends and concerns likely to cause job changes. The process produces superior results for all occupational levels.

DACUM Research Chart



Request information about DACUM workshops and/or DACUM facilitator training services offered by CETE from Dr. Robert E. Norton, Senior Research and Development Specialist, Center on Education and Training for Employment, The Ohio State University, 1900 Kenny Road, Columbus, OH 43210; phone: 800-848-4815 or 614-292-4353, extension 4-7667; fax: 614-292-1260

(Logo)

August 26, ____

Safety Sciences Department
Indiana University of Pennsylvania
117 Johnson Hall
Indiana, PA 15705-1087

Dear _____:

Please consider this letter as a proposal to conduct a DACUM occupational analysis on the environmental technology field on September 7-8, 19__ at Indiana University of Pennsylvania.

As we have discussed, you need to assemble a panel of experts (preferably 10-12 persons who are experts in the environmental technology area) for the two days of the workshop. Enclosed is an information sheet and a sample agenda that you may wish to share with panel members before the meeting.

We need for the workshop:

1. a room with at least one relatively clear wall of 10' x 25'
2. an overhead projector for the first morning
3. a flipchart stand and extra pad of paper, and felt-tip markers (black, red, and blue)
4. about 200 5" x 8" clear cards
5. about 40 sheets of 8½" x 11" cover stock
6. a person who can serve as recorder

You also need to arrange for a continental breakfast, lunch, and mid-morning and mid-afternoon refreshments.

The total cost of my professional services, travel and per diem, and DACUM chart preparation is $________. This fixed price proposal includes all expenses involved and the preparation and reproduction of 25 copies of the resulting DACUM Research Chart. Please indicate your approval of this plan so that arrangements can proceed. It would also be helpful if you would mail me a signed copy of the attached agreement. I look forward to working with you.

Sincerely,

Glenn Brown
DACUM Facilitator

DACUM WORKSHOP AGREEMENT

Date: ________________

To: DACUM Program Director
Center on Education and Training for Employment
The Ohio State University
1900 Kenny Road
Columbus, OH 43210

The Safety Sciences Department of Indiana University of Pennsylvania agrees to the DACUM workshop arrangements as outlined in your letter dated ____________ and agrees to pay the Center on Education and Training for Employment the amount of $________ for conducting a DACUM workshop at Indiana, Pennsylvania on September 7-8, 19__. A check/purchase order for that amount is enclosed/will follow.

Signed: ____

Name: ____

Position: ____

Address: ____

____

____

____

Duty B—Plan the DACUM Workshop

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Task B-1. Conduct Job Analysis Literature Search

One of the first tasks the facilitator may want to perform is to conduct a search of the literature for existing job analyses. However, many facilitators, consider this task to be unnecessary when the standard two-day DACUM workshop process is used. A well-selected committee of expert workers properly guided by a trained facilitator can produce results that are just as high, if not higher than, those achieved without using a literature base for reference.

You may want to search the literature.

When you are limited to conducting what is commonly referred to as a modified DACUM (a time period of less than the recommended two full days), you should probably search the literature for available job analyses, if any, in your area of concern. A compilation of all the duties and tasks found in the literature should result in a comprehensive listing of all the unique duties and tasks found. Three major challenges face the facilitator in developing such a compilation.

First, it may be difficult to find one or more recent (less than eight years old) job analyses (DACUM or others). Four excellent sources of existing analyses are: (1) DACUM Research Chart Bank maintained by the Center on Education and Training for Employment (see page B-21), (2) The DACUM Chart Exchange maintained by Humber College (see page B-22), (3) many of the regional and state operated curriculum centers and laboratories (see page B-23), and (4) the ERIC Clearinghouse on Adult, Career and Vocational Education (see page 23).

Sources of existing analyses.

The **second** challenge is coping with differences in terminology. For example, while most U.S. DACUM facilitators use the duties, tasks, and steps terminology, Ohio uses units, competencies, and competency builders, respectively, to mean approximately the same thing. Many Canadians use general areas of competence (GAC's) instead of duties, and skills instead of tasks. Many Canadian job analysts also include worker behaviors and tool and equipment items among their skills.

Beware of different terminology.

The **third** challenge arises when comparing task statements from one list with the others to prepare a unique and updated listing of tasks. Because of verb differences or other factors, it is often difficult to know whether different-sounding tasks are really different tasks or are the same ones with some slight wording differences.

So, why should a DACUM facilitator conduct a job analysis literature search. Three major reasons are worth noting. First, if the facilitator is forced into a limited time frame of less than two days, and must therefore conduct a modified DACUM, a literature-based listing of duties and tasks is almost essential as a starting point. Second, the literature search and review can provide a good idea of what has already been done where and by whom. Third, the literature can also be very useful as you develop a working definition of the occupation (see Task C-1).

Task B-2. Orient Stakeholders to DACUM

Stakeholder support is very important.

To ensure that a successful and productive DACUM workshop occurs, considerable planning and preparation must take place prior to the actual workshop. One of the major areas of concern involves orienting the stakeholders to DACUM and obtaining their support. A stakeholder is anyone who has a significant role in planning, conducting, or evaluating the outcomes of the DACUM-based education or training program.

Strong administrative support is critical to success.

Before any DACUM workshop is planned or conducted, key personnel within the institution, company, or agency must be informed and, more importantly, become committed to the DACUM process. Strong administrative support is critical to its success as a curriculum development or program evaluation tool within any setting.

There should be at least general agreement as to how the occupational analyses resulting from DACUM will be used to develop new training programs or to evaluate and revise existing ones. The more committed the institution is to competency-based education/training and to offering relevant vocational-technical education programs, the easier it should be for DACUM to fit naturally into the agency, company, or institution's system for instructional program development and review.

In situations where administrative and staff support does not exist, steps must be taken to explain what DACUM is and how it can benefit the company or agency. In some cases, the facilitator may need to provide this orientation and obtain the necessary support and approval.

Information presented in the introduction and some other sections of this handbook may be used for this purpose. In other situations, it may be advisable to obtain the services of a qualified DACUM facilitator from another agency to conduct orientation training sessions for concerned administrators and instructional staff.

Involve Staff in the Planning Process

Whenever a facilitator conducts activities that may affect others the way DACUM can, that person must involve, in appropriate ways, **all those persons who are likely to be affected by or concerned about the resulting changes.** Involvement elicits their understanding and support of the process, which is vital for any significant changes to take place as a result of DACUM.

Involve all appropriate persons in planning DACUM activities.

For Educators

When planning a DACUM workshop for an educational institution, the facilitator should try to involve the following types of personnel: (1) administrators, (2) instructional staff, (3) support personnel, and (4) advisory personnel.

Administrators. Although the specific administrators who need to be involved will vary from institution to institution, persons such as academic deans, occupational deans, vocational directors, program area coordinators, staff and program development directors, and instructional development coordinators are the administrators most likely to be concerned. All of these persons should be aware of the facilitator's plans, and some of them will need to approve the time schedule, budget, personnel involved, and occupational area(s) selected.

Instructional staff. It is obvious that if the DACUM is intended, for example, to analyze the auto mechanics trade and the current auto mechanics instructors are to support that effort, they must become involved. The instructors can usually be helpful in identifying various employers in the community that employ the type of experienced people needed for the DACUM committee. Although the instructors should never serve as participants on the committee itself, they are probably the best single source for identifying potential employers and/or participants. The instructors' involvement in this identification process will enable them to play a significant role in helping to organize the committee.

Sometimes an instructor or group of instructors resists involvement in the planning process. Resistance may arise for many reasons, but usually it disappears quickly once they understand what DACUM is all about and how it can help them do a better job.

Occasionally, instructors who continue to resist the development of a DACUM chart for their area may be aware that portions of their training program are out of date, and they may fear any disclosure of this situation. Such instructors should be assured that the DACUM chart itself does not reveal, in any public way, any possible discrepancies between what is being taught and what should be. That type of analysis is left to the instructors, program development specialists, and other pertinent school personnel after the DACUM committee has gone home. In addition, there are virtually **no** training programs that do not become out of date at some point in our technological age. It is to be expected. That is why the DACUM process should be used to develop and maintain curriculum relevance.

Support personnel. Depending on the institutional situation, various support staff may need to become involved and can be helpful in the planning process. If an institution has curriculum or instructional development specialists available, and if they are not serving as the DACUM facilitator, they have an obvious role to play in helping to identify the program areas needing DACUM charts as well as in helping the instructors make any curricular changes suggested by the DACUM analysis.

Advisory personnel. Advisory committees and/or the institution's vocational advisory council may also be involved, first in deciding what occupational area(s) should be selected for occupational analysis, and second in identifying employers who hire the type of experienced people needed. The occupational advisory committee is usually closest to the particular industry or business of concern and can be helpful in identifying employers. The advisory committee also may be able to suggest some names of potential participants.

For Business Trainers

As with educational institutions, the facilitator working with a governmental agency or a business will need to orient key personnel to the DACUM process. This will probably include the following categories of personnel: (1) business unit/department manager, (2) company/agency training manager, (3) internal customers, and (4) sponsors.

Business Unit/Department Manager. This person is responsible for all that goes on in his/her unit and will want to know about the time and costs involved and what the likely benefits will be. You'll need to explain why DACUM is better than other methods of analysis and how the resulting data can be used directly or indirectly to improve the unit's productivity and profits.

Company/Agency Training Manager. This person is potentially a major user of the occupational analysis data as a basis for needs assessment, the development of training materials, guiding trainee competency development, and assessing trainee performance. If the training manager is oriented and involved up front, she/he is more likely to use the results and support the overall DACUM activity.

Internal Customers. These people work under the Department and Unit Managers and usually are the ones who initiate requests to have DACUM workshops conducted for their work area or group. Needless to say, these leaders need to know what DACUM is and specifically how it can help them meet ISO 9000 requirements, identify training needs, etc. Without such information, they probably will not request the facilitator's services even if they are badly needed.

Sponsors. In most companies, the internal customer will appoint a sponsor or contact person to work with the DACUM facilitator to plan and carry out the details of the workshop. These individuals need thorough orientation to DACUM because they will likely: (1) select the committee members, (2) share preparatory information with the members, (3) monitor and adhere to the timelines, and (4) act as a coordinator between the DACUM facilitator and customer.

Task B-3. Develop Committee Member Profile

Two major questions to be answered at this time in the DACUM workshop planning process are: What personal characteristics should the DACUM committee represent? and How many persons of what job titles should be selected?

Note the very important DACUM personnel selection characteristics.

The following personal characteristics should be carefully considered, whatever the job or occupation being analyzed:

a. Appropriate gender mix
b. Appropriate racial mix
c. Geographic representation desired
d. Levels of job representation (e.g., in schools: elementary, junior high, senior high, or all three; in industry: apprentice, journeyperson, and/or master craftsperson)
e. Size representation (e.g., large, medium, small employers)
f. Workers' years of experience
g. Currently employed full-time, part-time

Sometimes it is safe to let the random selection of expert workers give you the desired committee member characteristics. At other time, it can be very, very important to consider the first three categories carefully.

The decision on how many persons with what job titles to select for the committee deserves careful thought. **Remember that the committee members are the content experts for the entire process, and, therefore, must be selected with the utmost care.** The DACUM committee should be composed of 5-12 expert workers. The ideal panel has 7-10 members. Expert workers are those who perform the various job tasks of concern and are, without doubt, in the best position to explain "what they do" that makes them successful on the job. With fewer than five persons, the power of the process and the quality of the resulting DACUM Research Chart diminishes. With more than 12 persons, the committee becomes unwieldy and the satisfaction of committee members tends to lessen due to limited opportunities for input.

A range of 5-12 persons is recommended.

The presence of too many supervisors and managers can present problems. Supervisors and managers tend to contribute less than most expert workers, and in at least some situations their presence inhibits the free exchange of ideas. It is considered **okay** to have one or two immediate supervisors on the committee, provided they do not try to dominate the discussion or inhibit the free input of the workers. However, these supervisors must **not** be supervisors of any of the expert workers on your committee. When this occurs, some of the workers are likely to be inhibited to a significant degree.

Be careful about including supervisors of the expert workers.

Even when only expert workers are invited, you are still likely to end up with one or more supervisors attending. Supervisors can definitely be helpful in some ways. The immediate supervisors provide a "reality check" during the process, since they also know what the workers are expected to be able to do. The presence of one or two supervisors also limits the tendency of some workers to want to "enhance" their occupation by including management or other higher-level tasks that workers really do not perform.

A minimum of five persons are needed for a high quality DACUM workshop.

Because a reasonably sized group is required to obtain fair representation of the types of workers involved in the occupation, as well as to obtain needed group interaction, **a DACUM workshop should not be conducted with fewer than five members**. It is best to select ten to twelve persons, so that if one or two persons cannot make it at the last minute, the committee will still be of sufficient size to function effectively.

Task B-4. Arrange for Workshop Facilities

Because the DACUM process depends heavily on group dynamics, certain features are required of the room in which the workshop will be conducted.

An unbroken wall surface of 30 feet is recommended.

The room should have an unbroken wall surface of at least 30 feet and should be of sufficient size to house the participants and any observers comfortably. There should be no doors, windows, or other obstructions on the wall that will be used to construct the DACUM chart.

A good environment is essential.

The room should be attractive and located in a quiet area that is well lighted and well ventilated. The facilitator should check the lighting and climate controls before the workshop to ensure that they are functioning properly. A committee cannot function effectively in an environment that is too hot, too cold, or too stuffy.

If observers are to be invited, the observers' section of the room must have easy access to a side door to avoid distracting or disrupting the committee. If the room to be used is small and lacks side or rear door accessibility, it is best to discourage observers, as their movement in and out of the room may be disruptive.

For Educators

For educators, there are pros and cons to conducting the DACUM on-campus versus off-campus. As long as the room is conducive to group interaction and is free from distractions, the specific location is a secondary consideration. Some schools and community colleges may want to bring the committee members to the campus for public relations purposes, as well as to make it easier for other faculty and administrators to stop by and observe the proceedings. Others may prefer to use motel meeting rooms, which may offer better physical arrangements and greater convenience for lodging and meals.

For Business Trainers

For companies and government agencies, there are similar pros and cons to conducting the workshop in-house versus at a local hotel or college. Experience has led the writer to conclude that there are fewer distractions if the workshop is conducted away from the immediate worksite. Hotels in many cases also are better suited to provide media equipment and food service.

Task B-5. Schedule Workshop and Related Activities

A good schedule is important to a successful DACUM workshop. First of all, **for the standard DACUM workshop, you need to allocate two full days for most occupations**. For occupations that are highly cognitive in nature and more abstract, it may be best to allocate two and one-half or three days. In most cases, two consecutive week days will be best. If necessary, however, workshops can be successfully conducted over the weekend, or even on five consecutive half days. In establishing a date for the workshop, you need to check on the availability of the facilitator, the availability of the meeting room, and most important, the availability of potential committee members. Some occupations are seasonal in nature, and obtaining the expert workers you want for two days is likely to be impossible. For example, accountants are busy with tax preparations each January through April.

The following suggested schedule and activities have proven helpful and may serve as a guide to avoid forgetting something really important during the pre-workshop planning phase.

60 to 90 Days Prior to the DACUM Workshop

- Decide on the job or occupational area to be analyzed.
- Establish dates for the actual workshop (experience indicates that two full days are needed to analyze most occupations).
- Decide who will serve as DACUM facilitator and confirm dates and other arrangements. See the section on facilitating group interactions for details regarding the skills and personal characteristics needed.
- Decide who will assist in the planning and coordination of the workshop. In most cases, the facilitator or support staff will initiate and confirm most of the necessary arrangements, although others may assist, if desired.
- Prepare a general written description of the job or occupational areas to be analyzed. This is needed to guide the identification and selection of DACUM committee members and possibly for the orientation of the committee during the workshop.

You are more likely to obtain cooperation from employers if you ask their help early.

30 to 60 Days Prior to the DACUM Workshop

- Complete the identification of employers and/or departments who are able and willing to release expert workers and/or supervisors.
- Prepare or adapt a written explanation on DACUM to share with employers and prospective committee members.
- Arrange to visit companies, businesses, departments personally, if possible, to explain DACUM and to request their cooperation in the identification and release of expert workers.
- Contact all nominees in person (if possible) or by phone to explain DACUM and answer possible questions.
- Make arrangements for an appropriate workshop meeting room (recommended arrangements were discussed in detail in this section).

Orient prospective committee members about DACUM.

20 to 30 Days Prior to the DACUM Workshop

- Confirm all arrangements made with DACUM committee members by letter, indicating workshop location, time, directions, and so forth. Copies of these letters should be sent to the appropriate supervisors or managers of the workers.

- Make the necessary arrangements for refreshments and meals.

- Identify someone to serve as recorder during the DACUM workshop. The sole function of this person is to record the wording of duty and task statements agreed on by the committee, as directed by the facilitator.

Complete arrangements.

5 to 10 Days Prior to the DACUM Workshop

- Make phone calls to DACUM committee members to confirm their participation, answer questions, and so forth.

- Assemble workshop equipment and supplies (refer to listing under Task B-11).

- Decide whether observers are appropriate and, if so, extend invitations specifically to observe. Make it clear that observers are **not** being invited to participate as committee members.

- Identify and select an agency representative (e.g., administrator/manager) to open the workshop proceedings. Comments should include an explanation of why the DACUM analysis is being conducted and words of greeting and thanks to the committee for their participation. Make sure the welcoming official understands what he/she is supposed to say and how long to talk (5 minutes) during the opening session.

- Review workshop plans with the DACUM sponsor/host.

- Prepare an agenda for distribution to the committee, observers, and other support staff for distribution prior to and at the start of the workshop.

Confirm and finalize arrangements.

Day Before the DACUM Workshop

- Make final check of the room, supplies, workshop materials, equipment, refreshments, and all other workshop arrangements. Ensure the workshop meeting room is arranged appropriately.

Final check.

Task B-6. Arrange for Support Services

Your DACUM workshop will require two primary types of support services: media equipment and food service.

Media equipment and food service.

While the media demands are not high, they are important. The following equipment is recommended:

- One overhead projector
- One projection screen (unless wall is suitable)
- One or two lecture pad stands

While the lecture pad and paper will be used throughout the workshop, the overhead is normally used for only the first hour of **day one**.

Adequate food service is important to the success of DACUM workshops. Recommended are a continental breakfast of juice, coffee, tea, and bagels or pastries upon arrival (8:00-8:30 a.m.), coffee and tea during morning breaks, a buffet-type lunch at noon, and soft drinks plus more coffee and tea for afternoon breaks. (Many food caterers who will provide this type of food service for $8-12 per person per day.) It is appropriate to provide the panelists with lunch, given that they are contributing their valuable time and expertise. The buffet arrangement works best because the lunch break can be limited to one hour. Taking the DACUM panelists out somewhere for lunch can take considerably longer.

Task B-7. Decide Whether to Allow Observers

Should persons be allowed to observe all or part of the DACUM workshop or not? In most cases, the likely benefits for allowing a few observers will probably outweigh the possible disadvantages. Certainly, observers should be carefully selected and instructed to enter, observe, and leave the room quietly. You may wish, of course, if appropriate, to briefly introduce them so the committee will know the reason for their visit.

Who should be allowed to observe? Who should be encouraged to observe?

For Educators

Most colleges, schools, and universities that host DACUM workshops invite faculty members, support staff, administrators, and selected others (e.g., advisory council, committee chairpersons and members) to observe all or part of the workshop. Some institutions invite representatives of the news media to stop by and observe the proceedings, and to photograph and/or interview participants during lunch or other break times. Although excellent publicity may be obtained this way, care must be exercised so that observers do not interfere with the occupational analysis process itself. All observers need to be instructed politely, but firmly, that they may not ask questions during the proceedings or otherwise participate in the committee's discussions.

For Business Trainers

In most company or governmental agencies that host DACUM workshops, a few persons are usually invited to observe the DACUM workshops. As with educational settings, the supervisors, unit manager, and training personnel will want to observe firsthand how the process works and how it's being received by the committee members. Actual observation of a well-conducted DACUM workshop provides a golden opportunity to explain how the process really works. Probably the best time for observers is the last half-day when development of the four lists of worker attributes and review and refinement is occurring.

Task B-8. Select DACUM Workshop Team

The DACUM workshop team will usually consist of four or five carefully selected persons. These persons performance will determine to a large degree the success or failure of the workshop.

Facilitator. This is the formally trained person who knows how to plan, conduct, and carry out the recommended follow-up activities of a DACUM workshop. A word of caution is in order here. **Do not employ as a facilitator someone who has only read about or observed someone else conduct a DACUM workshop.**

The DACUM Facilitator must be trained and certified.

In terms of the DACUM Research Chart on the role of DACUM Facilitator, the facilitator will always **Orient the DACUM Committee - Duty D**, **Manage the Group Process - Duty E**, and **Facilitate Chart Development - Duty F**. When the facilitator performs only these three duties, a DACUM coordinator is usually appointed and assigned to the other duties (A, B, C, G, H).

In businesses and agencies where two or more trained facilitators are available, facilitators report that they often team up to conduct a workshop. In this situation, they usually take turns rotating between the role of facilitator and recorder.

Facilitator teaming works well for some.

Regardless of who actually performs the pre-workshop planning and recruitment of committee members, it is essential that the facilitator monitor the process carefully to help assure needed arrangements are made and the right expert workers are selected.

DACUM Coordinator. In many businesses, government agencies, and community colleges, a person designated as the DACUM Coordinator is often assigned to carry out pre-workshop and post-workshop activities. This person will do all the marketing activities, the initial workshop planning and the recruitment of workshop committee members. The coordinator is also likely to be responsible for most, if not all, post-workshop activities such as conducting task verification and publishing the DACUM Research Chart.

If desired, there is absolutely no reason why the DACUM Facilitator cannot also perform the duties and tasks designated for the coordinator.

Recorder. A recorder should be selected to assist the facilitator from the beginning to the end of the workshop. This person's primary function is to print the duty and task statements legibly on cover stock or cards that are attached to the wall. The recorder should be able to do the following:

- Listen attentively to committee members
- Take direction from the facilitator
- Print quickly and neatly
- Spell words correctly

The recorder must resist the temptation to speak about or write task statements before the facilitator has obtained the consensus of the committee. The recorder may also be asked to transfer all information from the wall to sheets of paper at the end of each session and at the conclusion of the workshop.

Sponsor/Host. Usually a company, government agency, or organization will sponsor and/or host the DACUM workshop. The sponsor should be involved with all the planning and arrangements and should also be present during the workshop to greet committee members and answer questions that may arise.

Agency/Representative. While the sponsor may sometimes serve in this capacity, it is more common and preferred to have an official agency representative available to (1) officially greet the committee during orientation, (2) officially tell why the analysis is being conducted and how the agency plans to use it, and (3) to help define the scope of the job or occupation to be analyzed during the organizational chart brainstorming.

In a company setting, the unit manager or supervisor or someone representing the training department may serve as the agency representative. In education, a vice-president, dean, associate dean, or department head will usually serve as the official representative.

Task B-9. Prepare Workshop Agenda

The workshop agenda should specify the beginning and ending times of the workshop and outline the major activities and the approximate times they should occur. The agenda may be specific to the dates and committee involved or it can be more generic. It is reassuring to the committee that the workshop is well planned and members can see the major time frames needed. The agenda should be distributed at the beginning of the orientation. See page B-25 for a sample recommended agenda.

Task B-10. Obtain Workshop Materials

A few days before the workshop begins is a good time to check your supplies and materials to see if you have everything needed and in adequate supply. The following supplies and materials are recommended in the quantity indicated:

Supplies

- Lecture pad paper (2)
- U-HOLD IT putty (1 package)
- Felt-tip markers (3 black, 3 red, 3 blue)

- 5" x 8" unlined white file cards for writing task statements (200)
- 8½" x 11" card stock, any color for writing duty statements (25)
- Note paper for participants (25)
- Pencils for participants (12)
- Masking tape (as back-up to putty)

Materials

- Workshop transparencies (see Appendix A)
- Sample, high quality DACUM charts (15)
- Workshop agenda (12)
- Task and task statement criteria handout (see pages D-31 to D-33)
- Workshop evaluation form (12)
- Participant name tents (and tags, if desired)
- Participant roster

The Facilities, Media, and Materials Checklist (page B-26) can be used by the DACUM Facilitator to make sure all necessary arrangements have been made and verified completely before the workshop begins.

Task B-11. Prepare Room for Workshop

Arrange the room.

To facilitate the interactions that must take place in a DACUM workshop, the participants should be comfortably seated so that they can easily see and hear each other, as well as read all items placed on the wall. The best arrangement is to seat participants in comfortable chairs behind tables that are arranged in a semicircle. The participants should actually face the wall upon which their ideas will be written and displayed; however, they must also be able to see and hear other participants. The tables serve a twofold purpose: they create a work space for the committee members and act as a barrier between them and the wall. A small table for the recorder should be located at one end of the wall. Figure 1 illustrates the desired seating arrangement.

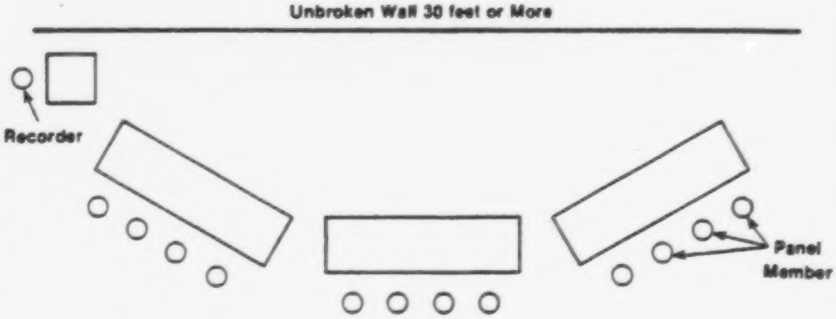


Fig. 1. Ideal DACUM seating arrangement

A refreshment table should also be set up in the rear or on one side of the meeting room (e.g., coffee, tea, soft drinks, pastries) during breaks and throughout the workshop sessions. See page B-27 for a desirable room arrangement for conducting a DACUM workshop.

Task B-12. Monitor Logistical Arrangements

Be prepared.

While important arrangements should have been initiated or made as Tasks B-4, B-5, and B-6 were conducted, you or someone you designate needs to closely monitor all the logistical preparations for the DACUM workshop. A glitch such as failure to have coffee and tea available as the expert workers arrive, not having the room set up correctly, or not having the needed audiovisual equipment, can put a serious damper on your workshop. Other events such as not having enough food for lunch or running out of supplies can make you appear very disorganized.

The day before the workshop, you or your designee should very carefully verify that name tents, parking permits, food, audiovisual equipment, the facilities, and other supplies will all be ready to go. Monitoring these pre-workshop preparations can help insure the success of your DACUM workshop.

the
DACUM
connection

DACUM Research Chart Bank

A LARGE COLLECTION of DACUM research charts covering a wide range of occupations has been collected and catalogued. These charts, all developed either by CETE staff or by persons we have trained, represent applied curriculum research of the highest quality.

This service is offered to assist curriculum developers and others who wish to develop either a competency-based education or performance-based training program, but for whatever reason, cannot immediately conduct a local DACUM workshop of their own. High-quality DACUM charts imported from elsewhere can provide valuable start-up information and/or serve as a basis for conducting a modified DACUM workshop. However, it is highly recommended that any chart purchased from CETE or elsewhere be locally verified (validated) via a mailed task verification process or appropriate advisory committee review.

The Center wishes to make it emphatically clear that while offering its collection of high-quality DACUM charts for sale at a minimal fee, it in no way wishes to discourage schools, community colleges, technical institutes, government agencies, and businesses and industries from conducting their own up-to-date locally relevant job or occupational analyses. The quality of a current, locally conducted analysis developed by a ***trained*** facilitator and a qualified panel of 5-12 expert workers, ***cannot*** be matched by a chart developed elsewhere.

A listing of the over 300 available DACUM charts is presented on the following pages. Individual charts can be ordered at $10 per copy (U.S. funds). For 13 or more charts, the price is $8 per copy. In addition, a 10% handling charge (minimum of $3.50) will be applied. Upon special request, we will also fax charts at $5.00 per chart additional charge.

For information about DACUM occupational analysis workshops, DACUM Facilitator Training Institutes, and/or Systematic Curriculum and Instructional Development (SCID) Workshops, write, call, or fax Bob Norton at 800-848-4815, Ext. 4-7667 or Debbie Weaver, Ext. 4-7682.

DACUM Research Chart Bank
ATTN: Robert E. Norton
Center on Education and Training for Employment
The Ohio State University
1900 Kenny Road, Columbus, OH 43210-1090
FAX: 614-292-1260
Phone: 800-848-4815 or 614-292-4353, Ext. 4-7667

Revised 8/96

THE DACUM CHART EXCHANGE

HUMBER COLLEGE
TORONTO, ONTARIO

A databank of nearly 1100 charts has been collected and catalogued during the past 15 years. They cover a wide range of occupational and skill related areas from Avionics Technician to Youth Worker.

Institutions and Agencies involved in producing DACUM Charts were invited, over the years, to contribute charts to the bank and in turn have been able to draw from it for their own purposes.

All interested individuals and organizations are herewith invited to draw from the current paper-based bank for a nominal fee. This is a non-profit, voluntary service offered on a professional, exchange, and resource basis by Humber College of Applied Arts and Technology.

List of Available Charts Can be Ordered at	$8.00 (CAN) per copy
Individual Charts Can be Ordered at	$5.00 (CAN) per copy

From

The DACUM Chart Exchange
Humber College
Research and Development Department
205 Humber College Boulevard
Toronto, Ontario
M9W 5L7

Phone: (416) 675-5061
Fax: (416) 675-6681

Institutions, Ministries, Agencies, and Private Sector Organizations are encouraged to add to the Database of "The Exchange" by sending a single copy of any DACUM Chart or Similar Curriculum Format to the above address.

Selected Curriculum Centers and Labs

REGIONAL CURRICULUM COORDINATION CENTERS

National Network for Curriculum Coordination in Vocational and Technical Education (NNCCVTE). Funded by the Perkins Act, NNCCVTE's six regional centers provide free services including computer database searches. Items are available for a 30-day loan. Regional contacts:

Northwest CCC, Clover Park Technical College
4500 Steilacoom Boulevard, Building 15
Tacoma, WA 98499-4098
(206) 389-5784

East Central CCC
University of Illinois at Springfield, K-80
Springfield, IL 62794-9243
(217) 786-6173

Northeast CCC
New Jersey Department of Education
Office of Adult and Occupational Education
Crest Way
Aberdeen, NJ 07747
(908) 290-1900

Western CCC
University of Hawaii
1776 University Avenue
Wist Hall 216
Honolulu, HI 96844-0001
(808) 956-7834

Midwest CCC
Oklahoma Department of Vocational and Technical Education
1500 West Seventh Avenue
Stillwater, OK 74074-4364
(405) 743-5423

Southeast CCC
Mississippi State University
Department of Technology and Education
Mississippi State, MS 39762
(601) 325-1552

NATIONAL ORGANIZATIONS

Center on Education and Training for Employment (CETE)
The Ohio State University
College of Education
1900 Kenny Road
Columbus, OH 43210-1090
(614) 292-4353 or (800) 848-4815, Ext. 2-4277

Products support linkages between employment and education, research and practice. Ohio public educators have access to a lending library for tech prep and equity materials.

Educational Resources Information Center (ERIC) Clearinghouse on Adult, Career and Vocational Education
The Ohio State University
College of Education
1900 Kenny Road
Columbus, OH 43210-1090
(614) 292-4353, Ext. 4-7685
Wagner.6@osu.edu

Computer searches of ERIC database are available on cost recovery basis.

American Association for Vocational Instructional Materials (AAVIM)
220 Smithonia Road
Winterville, GA 30683-9527
(706) 742-5355 or (800) 228-4689

Manuals, workbooks, computer software, videos for wide range of occupational education subjects. Publishes and distributes teacher and administrator education materials. Free catalogs.

CURRICULUM CONSORTIUMS

Vocational-Technical Education Consortium of States (V-TECS)
Southern Association of Colleges and Schools
1866 Southern Lane
Decatur, GA 30033-4097
(404) 697-4501, Ext. 543 or (800) 248-7701, Ext. 543

Validated, competency-based vo-tech outcome standards, curriculum resources and assessment vehicles. Flexible fee structure.

Multistate Academic and Vocational Curriculum Consortium (MAVCC)
1500 West Seventh Ave.
Stillwater, OK 74074-4364
(405) 377-2000 or (800) 654-3988

Competency-based instructional materials reinforce academic and workplace skills and reflect current industry standards.

INSTRUCTIONAL "MATERIALS" LABORATORIES

Vocational Instructional Materials Laboratory (VIML)
The Center on Education and Training for Employment
The Ohio State University
College of Education
1900 Kenny Road
Columbus, OH 43210-1090
(614) 292-5001 or (800) 848-4815, Ext. 2-5001

Develops current, business/industry validated materials and assessment products for all areas of vocational-technical education.

Instructional Materials Laboratory
University of Missouri-Columbia
2316 Industrial Drive
Columbia, MO 65202
(573) 882-2883 or (800) 669-2465

Develops competency-based curriculum ready for the classroom. Lesson plans and student workbooks directed toward school-to-work, tech prep and integrated curriculum concepts.

Curriculum and Instructional Materials Center (CIMC)
Oklahoma Department of Vocational and Technical Education
1500 West Seventh Street
Stillwater, OK 74074-4364
(800) 654-4502

Designs and distributes print and electronic resources for all areas of vocational-technical programs.

DACUM WORKSHOP AGENDA

DAY 1

8:00	Continental Breakfast
8:30	Welcome and Introductions
9:00	Orientation to the DACUM Process
9:30	Review the Occupation
10:30	Break
10:45	Identify the Duties and Tasks
12:00	Lunch
1:00	Reconvene - The DACUM Process
2:30	Break
2:45	Continue - The DACUM Process
4:30	Recess for the Day

DAY 2

8:00	Continental Breakfast
8:30	Reconvene - The DACUM Process
10:30	Break
10:45	Continue - The DACUM Process
12:00	Lunch
1:00	Develop Lists of: General Knowledge and Skills; Worker Behaviors; Tools, Equipment, Supplies, and Materials; and Future Trends/Concerns
2:30	Break
2:45	Review, Refine, and Sequence Duties and Tasks
4:30	Conclusion of DACUM*

*After the Welcome and Introduction, times are approximate.

Facilities, Media, and Materials Checklist

Occupation: ____________________

Workshop Dates: ____________________

Location: ____________________

Contact: ____________________ Phone: ____________

Room: ____________________

Parking: ____________________

Food Services: ____________________

Contact: ____________________ Phone: ____________

Ordered: ______________ Confirmed: ____________

Supplies:

______ Putty

______ Marking pens

______ Handouts

______ Pencils

______ Task cards, 5 x 8"

______ Name placards

______ Scratch pads

______ Overhead transparencies

______ Duty card stock (8½ x 11")

______ Sample DACUM chart

______ Form - record of committee members, supervisor name, and mailing address

______ Form - list of potential verifiers

Furniture:

______ Tables

______ Padded chairs

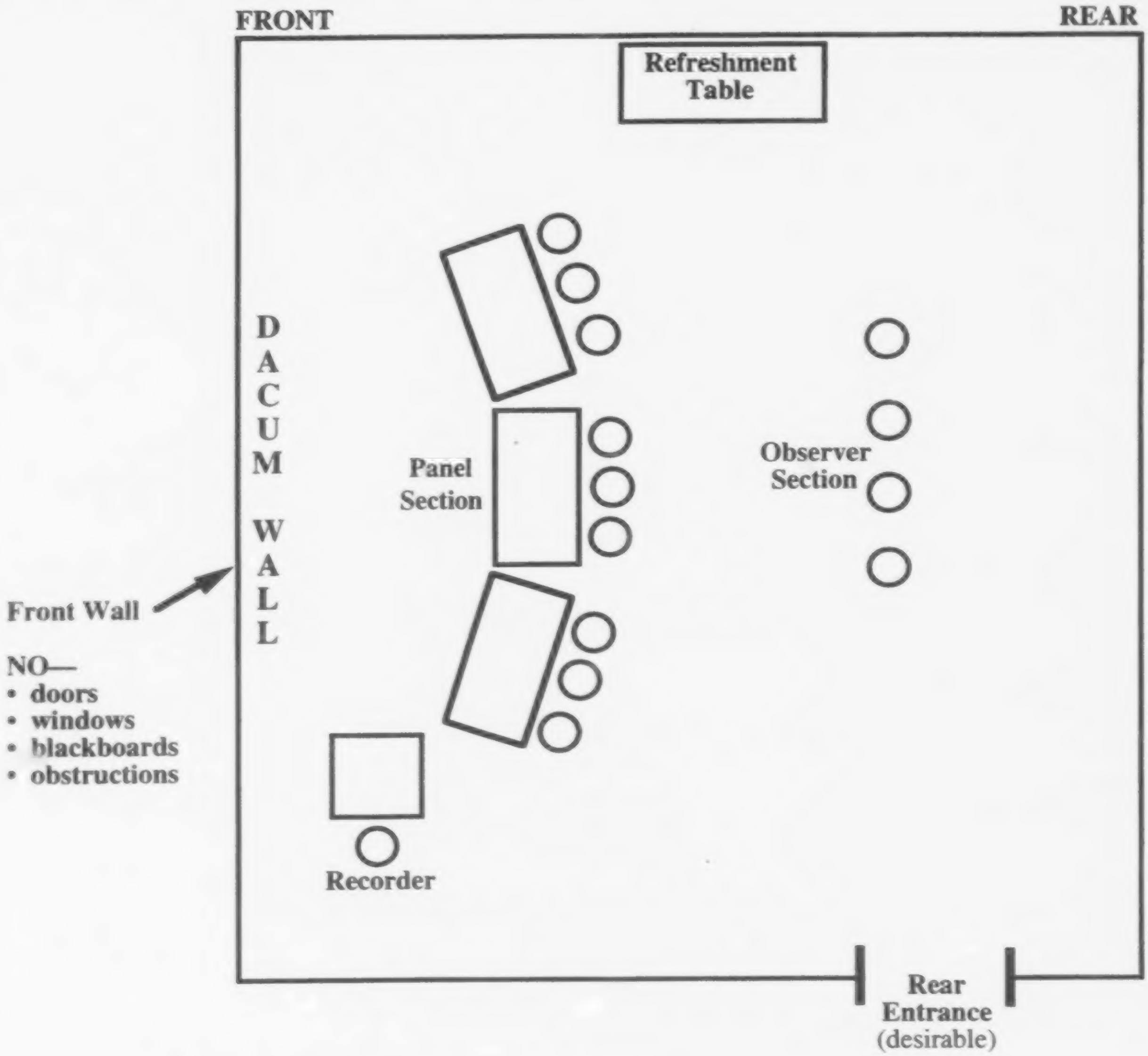
Media:

______ Flip chart/s

______ Overhead projector

Photographer: ____________________

Official Welcome: ____________________


FRONT
REAR
Refreshment Table
DACUM WALL
Panel Section
Observer Section
Front Wall
NO—
• doors
• windows
• blackboards
• obstructions
Recorder
Rear Entrance (desirable)

Suggested room arrangement for a DACUM workshop

Source: *The DACUM Coordinator: A Training Manual* developed for the South Carolina Technical Education System, Columbia, South Carolina, 1983.

Duty C—Recruit The DACUM Workshop Committee

Task C-1. Develop Working Definition of Job, Occupation, Process or Functional Area C-1

Task C-2. Research Sources of Committee Members C-3

Task C-3. Develop Expert Worker Selection Criteria C-5

Task C-4. Establish Geographical Area to be Represented C-7

Task C-5. Develop Criteria for Industry Representation C-9

Task C-6. Identify Key Contact Persons C-10

Task C-7 Assess the Need for Supervisor Representation C-12

Task C-8 Assess Need to Involve Special Interest Groups C-13

Task C-9 Explain DACUM to Employers When Recruiting C-14

Task C-10 Invite Committee Members C-15

Task C-11 Assist Committee Members in Obtaining Employer Approval . . . C-17

Task C-12 Accommodate Special Needs C-18

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Resources:

Expert Worker Selection Criteria C-19
Sample Letter to Employer C-21
Sample Letter to Panel Member C-22
DACUM Information Sheet C-23
Committee Member Data Sheet C-25

Task C-1. Develop Working Definition of Job, Occupation, Process, or Functional Area

Before recruiting DACUM panel members, it is absolutely essential to establish a working definition of the job, occupation, process, or functional area to be analyzed. Since the occupational definition used predetermines who is eligible for selection, the occupation must be defined as accurately as possible. Decisions must be made as to the types of workers to be included and excluded. Without the right expert workers on the committee, even the most expert facilitator cannot obtain the desired information.

Develop a working definition of the occupation carefully.

Whether the DACUM analysis is for business, education, or a government agency, the same scope or breadth of analysis question arises. There is always the danger of defining the occupation to be analyzed either too narrowly or too broadly. Defining the occupation too broadly may result in a program that requires more time than is reasonable or in trainees who receive only general preparation in a wide range of tasks. When the committee assembled for a DACUM is too diverse, the procedure tends to break down, because the members may be unfamiliar with much of the work performed by other members.

Avoid convening a panel that is too diverse. Jobs being analyzed together must have similar duties and tasks.

For example, an analysis of the clerical field may include persons employed as mail clerks, file clerks, receptionists, typists, secretaries, medical secretaries, legal secretaries, and administrative assistants. Although employees in these jobs may perform similar tasks, the overall nature of the jobs varies so widely that to attempt an analysis of such a broad occupational cluster through one DACUM would be unwieldy and probably inconclusive. It sometimes is reasonable, however, to analyze two closely related jobs, such as typist and secretary or mail clerk and file clerk, in one DACUM workshop.

When the scope of the analysis is appropriate, the DACUM process may provide justification for a separation or a merger of existing training programs. For example, which specific tasks separate a "legal secretary" from a "clerk-typist?" Should different curricula and training programs be developed? Which tasks are common to both jobs and which are different? Are the jobs on a parallel level with one another, or is successful experience in one job a prerequisite to employment in the other? Are there adequate job openings for the school or college to offer training on both fields? In a company or government setting, the question may be "are the positions similar enough that workers should be cross-trained on both?"

For help in developing a three-to-five sentence working definition that specifies the duties or general areas of worker responsibility, check the **Department of Labor's Dictionary of Occupational Titles (DOT)** and the **Occupational Outlook Handbook (OOH).**

Other useful resources for devising working definitions include existing job descriptions and occupational analyses. A number of state curriculum laboratories (e.g., Ohio, Oklahoma) have conducted occupational analyses and published their findings. See pages B-23 and B-24 for additional recommended sources.

A **caveat** is necessary at this point. Use any analysis obtained through the literature from another source with caution. In some occupations, a five-year-old list may be considerably out of date. Also, unless the tasks are verified by local experts, they may or may not reflect the actual tasks performed by local workers.

A working definition can be used to guide the identification of firms employing the types of workers needed for the DACUM committee. Later, the committee can be asked to modify the working definition to more accurately reflect their actual occupational analysis. The duties or general areas of responsibility are often adapted as phrases in the final definition.

Task C-2. Research Sources of Committee Members

Equipped with a working definition of the occupation to be analyzed, the DACUM facilitator is ready to begin the serious task of identifying workers with the type of expertise needed.

For Educators

There are many ways to identify sources of committee members and key contact persons within business, industry, and government. Seven major sources are discussed here, although there is no reason to limit the selection process to these. In most cases, two or more sources should be used to identify the type and category of expert workers needed for the DACUM committee.

Identify sources of potential committee members.

Instructor(s). Although instructors at the school or college should not be permitted to serve on the committee, they should always be asked to help identify potential committee members. Instructors should know of many of the firms employing the type of workers needed.

Instructors may also know contact persons within some of the agencies, and even some names of candidates. Take care to avoid having instructors nominate only former students or other persons who, for various reasons, do not meet the selection criteria (suggested criteria are outlined in the next section (C-3). Involving the instructors at this point, however, not only is a good means of identifying committee members, but can also help greatly to elicit or maintain their support for the DACUM procedure.

Advisory committee. As with instructors, the members of a relevant advisory committee—particularly if the committee has been active—may be an excellent source of employers' and/or potential employees' names. The advisory committee members also should be able to give sound advice on the various types of employers hiring the workers needed and on any specializations that ought to be considered.

Former students. In cases where a relevant occupational training program has been operating for several years, one or two former students may be selected for the DACUM committee, as long as they meet the specified criteria. In any case, add the employers of former students to the list of employing agencies to consider, regardless of whether former students are selected.

Chamber of Commerce. In most communities, the Chamber of Commerce maintains lists of various employers by occupational categories. Educators are usually more than welcome to use such lists, once their purpose is made known. The names, addresses, and phone numbers of contact persons are also commonly available from this organization.

Business and industrial associations. Many business and industrial groups form societies or associations for professional purposes. Some of these associations have business-education liaison committees whose function is to link with the schools and colleges in mutually beneficial ways. Such associations are rich sources of potential committee members and of information that can lead to contacts with potential participants.

Yellow Pages. Although not always a comprehensive listing, the Yellow Pages of the phone directory is a useful reference in most communities.

Public employment service office. This office exists in most urban communities and is usually able to provide the names and addresses of employers whom they have surveyed or who have listed job openings with them.

The careful identification and stratification (if appropriate) of employers in the labor market area served by the institution will be worthwhile in terms of the DACUM outcomes. The proper representation of expert workers and/or supervisors on a DACUM committee is **essential** to obtaining a relevant analysis of the occupation.

For Business Trainers

Researching sources of expert workers in a business-industry and governmental agency setting also presents some unique challenges. One challenge is deciding what plants and/or what offices should be involved. Another involves determining the most appropriate official(s) to contact and obtain needed approvals from. Another challenge often described is identifying the best time for the workshop (time least likely to impact on worker productivity). There is also the concern of obtaining fair representation of workers from different shifts when such applies.

Task C-3. Develop Expert Worker Selection Criteria

One of the most important tasks associated with the DACUM workshop is selecting committee members. Individual members selected for the DACUM workshop should possess several important qualifications. The proper selection of these committee members is probably the most critical aspect of organizing a successful workshop. The quality of the interactions that will take place, as well as the quality of the resulting DACUM chart, depends heavily upon the persons selected. Committee members must either hold employment positions within the agreed occupation definition or act as immediate supervisors in this occupational area. Decisions must be made, based on selection criteria, as to the types of workers to be included and excluded. Experience suggests the following criteria should guide the selection process:

Here are the recommended expert worker selection criteria—these need to be closely observed.

1. **Technical Competence**. Individuals selected should be highly skilled in their job and should be aware of current developments and needs in the field. Many years of employment does **not** necessarily qualify a person as a competent DACUM committee member. Generally, the

workers' immediate supervisors or peers can recommend the most technically competent individuals.

2. **Full-Time Employment**. Individuals selected should be **currently** employed in the occupation on a full-time basis. This helps ensure their knowledge of and familiarity with all the aspects of the job. Some may be supervisors, as long as they are directly supervising the workers whose job(s) are being analyzed. Supervisors who have had recent practitioner-level experience in the job can provide useful insights into the job being analyzed and add a "reality check" to the process. However, no more than 20 percent of the committee should be supervisors.

3. **Occupational Representativeness**. To the maximum extent possible, the make-up of the committee should reflect the actual employment situation for the job being analyzed. If the job to be analyzed is diversified in terms of workers' specifications, the committee members must be selected to reflect those specifications.

4. **Effective Communicator**. To be effective contributors, committee members should be reasonably articulate in order to explain what they do in a precise and accurate way. Because the DACUM workshop involves brainstorming and consensus seeking, committee members must also be able to listen respectfully to the views of others and participate effectively in small-group discussions.

5. **Team Player**. Committee members should be able to interact without dominating or being dominated and should not overreact to criticism or to having their contributions analyzed or reorganized. Ideally, each committee member selected should want to participate in the process. This excludes individuals who are "sent" without explanation or are simply assigned by their supervisor to "fill a seat" on the committee.

6. **Full-Time Commitment**. All committee members should be able to devote full-time to the DACUM workshop for the required period of time. It is important to stress being on time for all sessions, because individuals who are late or are part-time and will miss some of the orientation or group discussion may seriously disrupt the workshop.

7. **Freedom From Bias**. Committee members must be open-minded and free of biases related to the nature of the job and various elements of associated training. This is the primary reason why instructors should **not** be committee members. Instructors may try to influence the committee's contributions and thus adversely affect the process and how the information is shared. Instructors should be encouraged to attend the workshop as observers and as hosts to the event.

Summary. A good DACUM committee is representative of the best experts available in that occupational field. Sometimes pressure is exerted on a facilitator to include people in top management because of the perceived public relations value associated with their selection. Such pressures need to be firmly resisted. Personnel managers and other top executives are not effective participants because they are only generally aware of the competencies needed by current practitioners. The selection of managers or others who are not well qualified benefits neither them nor the committee and is likely to promote poor, rather than good, public relations. See page C-19 for a one-page summary of Expert Worker Selection Criteria.

Task C-4. Establish Geographical Area to be Represented

One of the first decisions to make when beginning the identification of DACUM committee members is to determine what geographical area should be represented. Then, in the actual selection process, care should be taken to ensure the members fairly represent the geographical area of concern.

From what area should the workers be selected?

For Educators

Although some DACUMs reflect a national or statewide orientation, most are based on the labor market area served by the particular community college or secondary school needing the analysis. In this sense, **labor market area** may be defined as that geographical region where the majority of school or college graduates obtain jobs or are likely to obtain jobs. If a state curriculum laboratory is sponsoring the analysis, the geographic area of concern will probably be the entire state, even though some students are likely to cross state boundaries for employment purposes.

Common Geographic Area Boundaries

Type of Institution	Area of Concern
School	School District or County
Community College (2 year)	Depends on program: county, multi-county, or statewide
College or University (4 year)	Depends on program: usually statewide or national

For Business Trainers

In business, the geographical area may be quite small (one plant in one city) or very large (plants located across the country and possibly international ones). If all the experts are in one location, the geographical area decision is automatic. If plants or workers are spread out across the nation and/or internationally, consideration should be given to conducting more than one DACUM workshop on the same job. Multiple workshops improve the representation and buy-in of more workers and may even reduce travel costs. A few examples serve to illustrate some of the options.

Group	Geographical Area
National Barbers Assn.	Entire country
American Welding Society	Entire country
Ohio State University	Regional representation
Contractors 2000 HVAC/R	Entire country
Vocational Teachers (CETE)	Entire country

Task C-5. Develop Criteria for Industry Representation

It has already been established that when selecting a committee, it is important to ensure that its members represent the entire region being considered. Depending on the particular occupation to be analyzed, it may also be desirable to stratify the companies by size (i.e., large, medium, small) and/or by type of employer (i.e., private versus public), and so forth. Whenever there are one or more factors that may influence the degree of worker specialization or other aspects of the worker's job, consideration should be given to selecting a stratified sample in order to obtain proportionate representation of each category of worker in the occupation.

What industries should be represented?

Task C-6. Identify Key Contact Persons

Identifying key contact persons is important. Whether you ask them for the names of potential committee members or for the names of persons you should be contacting to obtain nominees, these people represent a critical link in the communication process used to reach the expert workers. Use the same sources described in Task C-2 to help identify these individuals. Be sure to keep an accurate list, including their positions, phone numbers, fax numbers, and addresses.

For Educators

Treat key contact persons as VIPs, because as you contact them, they can either open the door of cooperation or slam it shut.

One rule that annoys some vocational teachers is that **instructors in the training program under consideration are not permitted to serve on the DACUM committee**, nor can they make any changes in the committee's chart when it is completed. This rule prevents an instructor from wittingly or unwittingly influencing the committee in accordance with his or her own interests and skills, or making the chart reflect the instructional resources available.

Instructors cannot serve on the DACUM committee for their program area.

Avoid any "weighting" of the committee that makes it unrepresentative of the occupation. For example, selecting several recent graduates of the occupational program being analyzed would not provide for fair representation of the total occupation. **Selection of the right participants is one of the keys to developing a comprehensive and valid DACUM chart.**

Invite Committee Members and Confirm Their Participation

At this point, you should have defined the occupation to be analyzed, identified potential sources of committee members, and determined the criteria to be used in the selection of members.

Two other major tasks must be carried out before the DACUM workshop: (1) contacting companies that employ the type of expert workers needed, and (2) contacting prospective committee members.

Contacting the company. A facilitator may be hesitant to contact an employer about participating in a DACUM workshop and releasing one of their best workers for two days. However, most business and industry personnel are truly interested in cooperating with vocational-technical educators when they feel the participation will be worthwhile.

Most employers will cooperate if they understand what DACUM is and how they stand to benefit from participation.

The main thrust in contacting an employer should be to convince the personnel manager, supervisor, or other contact that the school or college needs the company's help to update or establish a relevant educational or training program. The facilitator should assure the contact person that one or more expert workers from the company or business is needed to specify the tasks that workers in that occupation perform in order to be successful on the job. The facilitator should impress upon the representative that the results of the DACUM workshop will be used by the institution to develop a curriculum and instructional program that will produce skilled workers for that company and other employers in the community.

It is important for facilitators to make an appointment by phone and then to visit employers in person to explain the DACUM process and to request their cooperation. During the visit with the employer, the facilitator should explain the DACUM process, the role and qualifications of expert workers, and how the results will be used. Here is a situation where offering the employer some written materials about the DACUM process and a sample DACUM chart is helpful. Facilitators should also be prepared to write a formal letter outlining the request for assistance on their institution's letterhead, should formal approval be required.

A second option that may be used when time and/or travel funds are limited is simply to make a phone contact with the appropriate employer representative and explain everything over the phone. Although this approach has been used successfully, employers are more likely to take requests more seriously if the facilitator visits them on their own turf. Personal visits, of course, also permit the immediate exchange of relevant materials and a better opportunity for the facilitator to learn more about the firm. Personal visits may also allow for brief personal interviews with one or more prospective committee members, during which time the facilitator may be able to form an opinion as to whether the candidate(s) possess the desired characteristics.

A third option used successfully by some educational institutions is to invite employer representatives from a dozen or so companies to attend an orientation meeting on DACUM at the school. This approach, where suitable, offers a considerable savings of time for the facilitator when compared to making multiple company visits and presentations.

One approach that does not work well is letters. Written requests are often referred to public relations officers who may want to be helpful but may not be well qualified to assist. These persons may lack knowledge about the request and may nominate themselves or other people who are not technically or personally suited for the work. If a facilitator does use letters, they must be followed up by phone calls to discuss the request and the type of person needed as potential committee members.

Task C-7. Assess the Need for Supervisor Representation

Although there is some need for supervisor representation, it is highly recommended that a majority of committee members **always** be expert workers. The ratio of expert workers to supervisors of such workers on a DACUM committee should be about 5:1. However, as mentioned earlier, even when expert workers only are requested, employers tend to send supervisors or managers. The fact is that companies are often reluctant to release one of their top production line workers for two days and, to be cooperative, will send a supervisor or manager instead. Therefore, if you begin by asking for expert workers only, you will probably achieve the desired 5:1 ratio.

Expert workers are better committee members than supervisors.

Too many supervisors on a committee can cause problems. Any accepted for the committee should not be the supervisors of any of the expert workers on the same committee because of the possible intimidation factor. Supervisors also cannot be allowed to dominate or "pull rank" on the expert worker members. When they are properly oriented to their role, supervisors can contribute positively to the process and can help prevent the expert workers from overstating their actual work responsibilities. Experience has shown repeatedly, however, that the actual workers are better able than anyone else to clearly and comprehensively define their jobs. The best role for the supervisor is to identify and release his/her most expert worker to serve on the committee.

Task C-8. Assess Need to Involve Special Interest Groups

In most cases of organizing DACUM committees, you will want to focus on selecting persons who are experts in the job or occupation being analyzed. Only secondarily will you be concerned about where they live or who they work for.

There are likely to be some analyses, however, where it will be important to involve certain groups. For example, if you are analyzing registered nurses and want the support of all employers of nurses for your training program, you are well advised to invite persons to participate from several hospitals, public and private, from clinics, etc.

When working on occupations where workers are both unionized and non-union, you will probably want to involve a proportionate number of workers from each category.

If you are working with a Tech Prep or school to college articulation program, it is best to include each member agency in the planning and committee member selection process. Thinking carefully about when and how to involve special interest groups can help you avoid unneeded resistance, and instead, open the door of cooperation and support.

Task C-9. Explain DACUM to Employers When Recruiting

One of the hardest and most important tasks that you must perform —and perform well—is explaining DACUM to employers or other appropriate agency representatives. If you are going to conduct a DACUM workshop and need to recruit expert workers, you must impress these individuals with the importance of their participation. Therefore, upon contacting the appropriate company or agency representative who can authorize the release of one or more workers, you must explain clearly:

Be prepared to clearly explain the DACUM process to employers.

1. What DACUM is.
2. Why you want their involvement in the process.
3. Why you want their most expert worker(s).
4. Why you want the worker(s) for two days.
5. Why you want them for free.
6. Who else (other companies, agencies) is being invited.
7. How you plan to use the DACUM results.
8. How participation will benefit them.

The employer will also likely have questions such as: (1) What specific qualifications should the worker possess? and (2) When and where will the workshop be held? Your ability to clearly and convincingly present DACUM and answer these questions will usually determine whether you are successful in recruiting a committee member.

Be prepared also to answer questions the employers are likely to ask.

When recruiting committee members, be aware that some managers may at first be suspicious of your motives. Many managers have served on various school committees where they may have been expected to rubber stamp the work of some teachers and administrators. Stress that DACUM calls for a very different type of "start with a blank wall" type of involvement. Also, keep in mind that most previous requests for assistance were for two hours of time instead of two days.

When possible, it is best to make an appointment and visit the appropriate managers to explain the DACUM process and request their cooperation in nominating and releasing one or more workers. During the visit, the facilitator should be prepared to explain the DACUM process, how the results will be used, and the qualifications of the workers needed for the panel. Bring some written materials and a sample DACUM chart to leave with the management.

When travel funds are limited, you can "meet" by phone with the appropriate organizational representative. Make good use of your fax machine to transmit written materials before or during the phone meeting. Follow up phone calls within a week with a formal, written confirmation and introductory information about DACUM.

Usually a letter, by itself, will not elicit a response, let alone secure a committee member. Only in combination with other techniques will letter writing prove productive.

Task C-10. Invite Committee Members

Before you start inviting committee members, you will need to decide on the size of DACUM committee to be established. To obtain the "ideal" DACUM committee, composed of 7 to 10 participants, it is best to select 10 to 12 participants initially. That way, if one or two cannot make it at the last minute, the committee will still be of sufficient size to function effectively.

The most effective strategy for recruiting participants for a DACUM committee is to meet personally with each nominee, as arranged through the employer, 30 to 60 days in advance of the workshop. If there is sufficient time, this one-to-one technique elicits the best results. If a direct face-to-face meeting is not feasible, then person-to-person contact by phone is next best.

A previous, third-party personal contact at the company or agency may also be helpful; however, the facilitator's own involvement is invaluable. Persons sent to a workshop by the "boss," without any personal contact with the facilitator, may resent the assignment. Because the first contact makes the most lasting impression, the facilitator should try to arrange it personally, or with the help of the employer.

Direct contact with potential committee members is best.

If the facilitator must rely on third-party "agents" for the selection of committee members, he or she should impress upon the third-party agents the relevant criteria for selection of committee members. The facilitator will need to give the agents a written copy of the criteria to guide their selection efforts. The facilitator should give the contacts a letter of invitation, along with basic introductory information about the DACUM process.

Prospective committee members may be hesitant to commit to a new or different experience. The DACUM facilitator must explain the purpose of the analysis and the role of the committee member in the process. Tell members that they are being chosen because they are experts at what they do. Explain that they and some other workers from their same occupation will be asked to talk about the various tasks they currently perform on the job.

Because they are performing these tasks daily, they need no special preparation for the DACUM workshop. Each committee member is considered an expert. **Tell them that, simply put, the DACUM workshop cannot succeed without the help of expert workers, because they can describe their daily performance—in terms of the duties and tasks they perform—better than anyone else.**

During the explanation, the facilitator must stress the importance of a full-time commitment to the workshop. Each committee member is expected to begin, participate throughout, and finish the entire workshop. It is important to avoid asking someone to become a committee member if he or she is really not interested in the activity. Such a person will probably not contribute much to the development of the analysis and may even be destructive to the process.

Expert workers are essential to the success of all DACUM workshops.

The personal meeting or phone contact with an interested employer and/or candidate should be followed up immediately with a confirming letter (see pages C-21 and C-22), an overview of DACUM (see page C-23), and a map indicating the location of the meeting. Some facilitators also include a sample DACUM chart from an unrelated field. It is good policy to copy the worker's immediate supervisor on all correspondence.

While in contact with a worker who has indicated definite interest, a Committee Member Data Sheet should be started (see page C-25).

Task C-11. Assist Committee Members in Obtaining Employer Approval

In cases where the facilitator, for whatever reason, before contacting the employer, makes contact with a worker who is qualified and willing to serve on the DACUM committee, the facilitator should offer to help the worker obtain company approval. Such approval can usually be quickly obtained by getting the name, position, and phone number of the appropriate supervisor and making an explanatory phone call.

When proper recruitment and selection procedures are followed, few workers object to participating. Most persons consider it an honor to be selected as experts in their field and are glad to accept the responsibility, even when it means giving up some of their personal time for the activity.

Task C-12. Accommodate Committee Member Special Needs

Ask about any special needs committee members might have in the confirming letter sent to each member. Include a simple statement such as "If you have any special needs (e.g., dietary, physical), please let us know so we can accommodate you." In some cases, participants may request low sodium or vegetarian foods or accommodation for a physical handicap. The concerned facilitator will do whatever is required to help meet the special needs of committee members.

Task C-13. Confirm Participation of DACUM Committee Members

Once the committee identification and selection is complete, the DACUM facilitator is responsible for confirming the participation of all nominees. Send each committee member background information on the DACUM process and a sample DACUM chart as well as a letter of confirmation identifying the date, time, and location of the DACUM workshop.

It is highly recommended that the facilitator make confirming phone calls to each committee member immediately prior to the workshop. If a participant must cancel at this time, there is still time to seek a qualified alternate.

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Expert Worker Selection Criteria

One of the most important tasks associated with the DACUM workshop is selecting committee members. Individual members selected for the DACUM workshop should possess several important qualifications. Experience suggests the following criteria should guide the selection process:

1. **Technical Competence**. Individuals selected should be highly skilled in their job and should be aware of current developments and needs in the field. Many years of employment does **not** necessarily qualify a person as a competent DACUM committee member. Generally, the immediate supervisor or peers of the worker(s) can recommend the most technically competent individuals.

2. **Full-Time Employment**. Individuals selected should be **currently** employed in the occupation on a full-time basis. This helps ensure their knowledge of and familiarity with all the aspects of the job. Some of the persons may be supervisors, as long as they are directly supervising the workers whose job(s) are being analyzed. Supervisors who have had recent practitioner-level experience in the job can provide useful insights into the job being analyzed and add a "reality check" to the process. However, no more than 20 percent of the committee should be supervisors.

3. **Occupational Representativeness**. To the maximum extent possible, the make-up of the committee should reflect the actual employment situation for the job being analyzed. If the job to be analyzed is diversified in terms of worker specifications, the committee members must be selected to reflect those specifications.

4. **Effective Communicator**. To be effective contributors, committee members should be reasonably articulate in order to explain what they do in a precise and accurate way. Because the DACUM workshop involves brainstorming and consensus seeking, committee members must also be able to listen respectfully to the views of others and participate effectively in small-group discussions.

5. **Team Player**. Committee members should be able to interact without dominating or being dominated and should not overreact to criticism or to having their contributions analyzed or reorganized. Ideally, each committee member selected should want to participate in the process. This excludes individuals who are "sent" without explanation or are simply assigned by their supervisor to "fill a seat" on the committee.

6. **Full-Time Commitment**. All committee members should be able to devote full-time to the DACUM workshop for the required period of time. It is important to stress being on time for all sessions, because individuals who are late or are part-time and who miss some of the orientation or group discussion, may seriously disrupt the workshop.

7. **Freedom From Bias**. Committee members must be open-minded and free of biases related to the nature of the job and various elements of associated training. This is the primary reason why instructors should **not** be committee members. Instructor's may try to influence the committee's contributions and thus adversely affect the process and how the information is shared. Instructors should be encouraged to attend the workshop as observers and as hosts to the event.

Sample Letter to Employer

(Institutional Letterhead)

May 28, 19__

Dr. Andrew Brown
94 Livingston Avenue
Columbus, OH 43210

Dear Dr. Brown:

This letter will confirm our conversation about your willingness to release Kris Spencer to help us conduct a DACUM occupational analysis of the job of nursing assistant on June 24-25. Enclosed is a brief description of the DACUM procedure that we will be using and a copy of the letter that has been sent to Kris.

Our college greatly appreciates your cooperation in this important phase of our training program development process. With your assistance and that of other employers in the community, we can develop a curriculum that will better meet the needs of all workers.

Once the DACUM chart has been verified, we will send you a copy for your information and possible use. Should you have any questions about the DACUM process, please do not hesitate to call me at 292-4253.

Again, thanks for your kind assistance.

Sincerely,

John Adams
DACUM Facilitator

Enclosures

Sample Letter to Panel Member

(Institutional Letterhead)

May 28, 19__

Ms. Kris Spencer
50 Brook Drive
Columbus, OH 43210

Dear Ms. Spencer:

Thank you for being willing to assist us with our DACUM workshop to be held on June 24-25 at our institution.

I would like to congratulate you on being identified by your employer as one of the best nursing assistants in this area. We appreciate your willingness to participate in what will be a very helpful procedure for us, and we feel, a personally rewarding experience for you.

We will be starting at 8:30 a.m. sharp on Tuesday, the 24th, and will continue until about 4:30 p.m. each day. Enclosed is a map giving our exact location and a brief description of the DACUM occupational analysis procedure that we will be using. Please report to Room 1-C, in our 1960 Building by 8:15 a.m. for parking permits and coffee.

Should you have any questions, please call me at 292-4353. We look forward to having you with us.

Sincerely,

John Adams
DACUM Facilitator

Enclosures

cc: Dr. Andrew Brown

DACUM INFORMATION SHEET

WHAT IS DACUM (DEVELOPING A CURRICULUM)?

DACUM is a relatively new and innovative approach to occupational analysis. It has proven to be a very effective method of quickly determining, at relatively low cost, the competencies or tasks that must be performed by persons employed in a given job or occupational area.

The profile chart that results from the DACUM analysis is a detailed and graphic portrayal of the skills or competencies involved in the occupation being studied. The DACUM analysis can be used as a basis for (1) curriculum development, (2) student learning, (3) training needs assessments, (4) worker performance evaluations, (5) competency test development, (6) meeting ADA requirements, (7) ISO 9000 requirements, etc.

DACUM has been successfully used to analyze occupations at the professional, managerial, technical, skilled, and semiskilled levels. DACUM operates on the following three premises: (1) expert workers are better able to describe/define their job than anyone else, (2) any job can be effectively and sufficiently described in terms of the **tasks** that **successful** workers in that occupation perform, and (3) all tasks have direct implications for the **knowledge and skills, tools and equipment, and worker behaviors** that workers must have in order to perform the tasks correctly.

A carefully chosen group of about 5-12 experts from the occupational area form the DACUM committee. Committee members are recruited directly from business, industry, or the professions. The committee works under the guidance of a facilitator for two days to develop the DACUM chart. Modified small-group brainstorming techniques are used to obtain the collective expertise and consensus of the committee.

The DACUM committee is carefully guided through each of the following steps by the facilitator:

1. Orientation to DACUM
2. Review of job or occupational area
3. Identification of the duties (general areas of job responsibility)
4. Identification of specific tasks performed for each duty
5. Identify lists of: general knowledge and skills, tools and equipment, worker behaviors, and future trends/concerns
6. Review and refine duty and task statements
7. Sequence duty and task statements
8. Other options, as desired

Because of their current occupational expertise, committee participants do not need to make any advance preparation. Participants on past DACUM committees have, without exception, found the activity to be a professionally stimulating and rewarding experience.

COMMITTEE MEMBER DATA SHEET

Company Name ______________________________

Company Address ______________________________

____

Contact Person: Name ____________ Title ____________

Phone ____________ Date Contacted ________

Panel Member: Name ______________________________

Title (Job) ______________________________

Address ______________________________

____

SS No. ____________ No. of Years Employed ______

Expense, if any ______________________________

Communication:

Initial: By Phone ____ Date

Reminder ____ Date

Letter to Company ____ Date

Letter of Confirmation ____ Date

Letter of Thanks ____ Date

Letter of Thanks ____ Date

DACUM Chart Sent ____ Date

Other ______________________________ Describe Date

Comments:

Duty D—Orient the DACUM Committee

Task D-1. Greet Committee Members Upon Arrival D-3

Task D-2. Collect Committee Members Identifying Data D-3

Task D-3. Conduct Committee Member Introductions D-4

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Task D-9. Review High Quality Sample DACUM Chart D-15

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Task D-11. Present the DACUM Procedural Steps D-20

Task D-12. Explain the Workshop Ground Rules D-21

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Resources:

DACUM Committee Member Data D-25
DACUM Orientation Outline D-27
Supplemental Transparencies D-29
Developing Task Statements D-31

A few other important tasks remain to be completed before the workshop begins. Although these factors may be considered secondary, they can greatly facilitate the success of the DACUM workshop.

Name tents. The facilitator should have a secretary prepare typed name tents for each committee member with both their and their company's names on them. Name tents with large, easily readable type greatly help the participants and facilitator to become acquainted with one another. Have the names boldly printed on both sides of the name tents so that they can be seen by all the committee members and the facilitator.

During your personal interview or phone call with each committee member, ask the participant what name he or she wishes to be called and the proper spelling. Well-prepared name tents can help create a favorable first impression of your organization, as well as greatly facilitate personal interaction.

Parking and security. If the workshop is held on a school campus, the facilitator should be sure to inform security about the dates of the workshop and the number (and names) of visitors expected. It is a good idea to ask security personnel where the visitors should park and to obtain any needed parking stickers. You should also provide specific directions so as to avoid someone becoming lost or getting a ticket. The facilitator should also be sure to arrange with both janitorial and security personnel for the overnight safety of the room and its contents. The facilitator needs to particularly stress that "NOTHING IS TO BE REMOVED FROM THE WALL."

Messages. The facilitator should alert a secretary to route phone messages to the committee members. To minimize potential disruptions of the analysis process, it is preferred that a telephone **not** be present in the meeting room. Messages can be given to committee members during breaks. A phone should be available nearby for any essential return calls.

Public relations. Many institutions want to maximize the positive public relations potential that can result from a DACUM workshop. Some schools and colleges work with companies to prepare joint news releases, photographs, and special reports about the workshop. If an institution employs or can hire a photographer, the facilitator may want to have pictures taken that can be sent to the participants, the cooperating companies, and to the news media. A photo of the finished chart with committee members in front of the wall has a good visual impact for many audiences.

The DACUM facilitator may contact one or more local media representatives to arrange for interviews with the participants at the workshop. This type of activity should occur at lunch time or during breaks. Although media representatives may be invited to observe part of the DACUM workshop, they should not be permitted to conduct interviews or take candid, in-progress photographs that will distract the committee members during the analysis sessions. You may wish to supply the media with a list of the companies' and participants' names a few days before the workshop.

Official welcome. Be sure that any high-level administrator of the institution tapped to give the official welcome to the committee members is briefed as to the occupational area, the companies represented, the time of the meeting, and so forth. Such a welcome by a top administrator, as well as visits by other administrators, helps to convey to the committee the importance of its work to the institution.

Task D-1. Greet Committee Members Upon Arrival

Upon arrival at the workshop, the facilitator should enthusiastically greet each committee member. This is where the development of positive rapport begins. It is, therefore, very important to make each committee member feel welcome and sincerely appreciated. During the greeting, you should also:

Greet committee members warmly.

a. Provide a parking permit, if needed.
b. Offer coffee and other refreshments.
c. Tell where they can hang their coat, if appropriate.
d. Give them a name tent and tag (if used).
e. Inform them where to sit.
f. Answer any questions they may have.

Task D-2. Collect Committee Members' Identifying Data

At some time during the workshop, you need to ask the committee members to supply you with their name, address, and other desired identification information. Accurate information of this type is needed for completing the DACUM chart, for mailing thank you letters, certificates, and the printed DACUM chart. You also may wish to contact them for help with task verification and/or task analysis. See page D-25 for a suggested form for this purpose.

Collect accurate committee members identification data.

Task D-3. Conduct Committee Member Introductions

The normal procedure for conducting introductions is for the DACUM facilitator or host to call the meeting to order at the designated time and then to promptly introduce the administrator or other institutional representative who will be officially welcoming the committee members to the institution. Although the official welcome should be brief, it is important to have a high-level official formally greet the participants and publicly acknowledge the important contribution they will be making to improving the institution's educational programs. The formal welcome should **not**, however, be used as a public speaking opportunity to promote the institution's programs or services.

After the official welcome, the DACUM host should introduce the facilitator (assuming a different person fills this role) to the committee. The host should acknowledge the skills and experience of the facilitator that relate to conducting DACUMs. The most important thing is to keep the introduction brief and relevant to the DACUM activity.

At this point, the facilitator or facilitators (if teaming) should take over leadership of the workshop and maintain it for the next two days. The facilitator must immediately begin to create a friendly, warm, and cooperative atmosphere. After a few words of personal greeting, the facilitator should ask all of the participants to briefly introduce themselves. Specifically, they should give their **name, company or agency name, current position, and years in that position**. Introductions of this nature tend to help "break the ice," help others to pronounce each others' names correctly, and give the participants an opportunity to tell the other members anything they feel is germane to the task at hand.

Always ask the committee members to introduce themselves. Note the job titles used as this can reveal the presence of supervisors or managers.

The facilitator must quickly establish rapport with every member of the group and motivate them to want to participate actively in the process. The facilitator should try to quickly establish a first-name relationship with the participants, and point out how each member was carefully selected as one of the local experts in his or her particular occupation. It is important for the facilitator to congratulate the members sincerely for having been selected. The facilitator should also stress the importance of the participants' individual and collective contributions to the DACUM process.

The facilitator should also introduce the recorder and briefly explain the nature of that person's job. It is important that the committee members know that the recorder is not **one** of them, but is present to help the facilitator accurately record the committee's contributions.

If the program instructor(s) or coordinators are present as observers, it is appropriate to briefly introduce them in order to indicate their interest in the committee's work. Whenever possible, a teacher, instructor, trainer, or professor of an instructional program being analyzed should strongly be urged (if not required) to **observe** as much of the workshop as possible.

Task D-4. Facilitate an Ice-Breaker Activity

Many facilitators like to use an ice-breaker question such as "What would you do if you anonymously received $25 million? or "What little known, interesting event in your life are you willing to share?" Other workable "what" questions include "What was the most significant thing to occur in your life during the last year?" or "If you were to return to earth in a second life as an animal (or tree or flower), what would it be and why?"

A well chosen ice-breaker can be fun and it helps everyone relax and develop rapport with the group.

The key is to select some nonthreatening, participatory activity that is comfortable for the facilitator, one that is appropriate to his or her personality and leadership style. It is also important to select an activity that will not consume too much time.

It is crucial for the facilitator to demonstrate enthusiasm for the DACUM process and product. One approach is to discuss generally how institutions have successfully used the process to develop and update their curricula. The facilitator should be careful, however, to keep it short so participants do not have to listen to more than they want to or need to know. It is far more important to explain how the host institution plans to use the results of the committee's work to revise, upgrade, or expand current training programs in the occupational area of concern.

The facilitator can put the workers at ease and reduce possible anxieties by reminding them that their job is primarily one of collectively describing what tasks they perform every day in carrying out their jobs successfully.

Task D-5. Review Workshop Agenda

After the appropriate introductions, the facilitator's major responsibility begins. The facilitator must present a concise and accurate overview of the entire DACUM process in a relaxed but forceful manner. The facilitator can "make" or "break" the participants' motivation and enthusiasm for the workshop during the first few minutes of the orientation.

To help participants understand the overall DACUM workshop, a copy of the two-day agenda (see page B-25) should be distributed and reviewed briefly at this time. Point out the highlights, including starting and ending times, and answer any questions committee members may have. If you haven't already done so, this is a good time to explain the break schedule, lunch plans, location of restrooms and phones, and how messages will be handled.

Task D-6. Present Rationale for Specific DACUM Workshop

Having an appropriate agency representative spending five or ten minutes explaining the rationale for the specific workshop being conducted is absolutely essentially. The committee members, in spite of what they may have been told over the phone, are likely to wonder and may even be somewhat concerned about why DACUM is being conducted on their job. In an educational setting, it is important to have a principal, superintendent, department head, dean, vice president of instruction, or some other appropriate official explain how the information gathered will be used to develop a new program or expand and update an existing one.

Ask a credible agency representative to explain why the specific DACUM is being conducted. The representative should also answer questions the committee members may have.

In company and government agency situations when the workers aren't told by an appropriate authority (manager or supervisor), they usually think the worst is about to happen—restructuring, jobs being redesigned, or abolished.

The person selected to present this brief explanation must be credible to the committee. The DACUM facilitator usually is **not** credible for this purpose. The agency representative should also be given an opportunity to answer questions that committee members may have. It is good practice for the facilitator to discuss this role with the agency representative before the workshop and to clarify the purpose of the discussion and time limit.

Task D-7. Clarify Roles of Facilitator, Committee, Recorder, Observers, and Curriculum Developers

Before the DACUM process can begin, the facilitator must explain the roles of the committee, the facilitator, the recorder and observers, and present a clear and concise overview of the entire DACUM process. The facilitator's bearing and attitude should be such that the committee is encouraged to believe that the facilitator knows how to help them work together as a team to accomplish the desired outcome. Each member needs to be motivated to participate actively in the process. Their individual and collective contributions will be vital.

See the DACUM Facilitator Research Chart for a list of the specific duties and tasks of a facilitator. (See pocket of the inside cover of this notebook.)

Role of the DACUM Facilitator

The critical role of the facilitator in the DACUM process is presented here. Even though this information would not normally be discussed in great detail with the participants during orientation, it is necessary that anyone wanting to properly fulfill the role of facilitator know what knowledge, attitudes, and skills are involved. Later, in the section on managing the group process, a number of the more specific skills and attitudes required of the facilitator are addressed.

Process expert (the facilitator) and content experts (the committee members).

It is essential for the facilitator to establish his or her role clearly and thereby establish his or her credibility as the DACUM **process expert**, at the same time clearly acknowledging the committee members as the **occupational or content experts**. The facilitator need not know about the occupation being analyzed and, in fact, may wish to point out that it is usually better that he or she not know about the occupation. In that way, the facilitator is less likely to interject any personal biases into the analysis process.

The facilitator's job looks simple, but it is in fact a complex and demanding role. The DACUM facilitator's task is to orient the committee to the process, to guide them through the analysis, to draw out ideas, to question each proposed task statement, to gain consensus from the group on each item, and to keep the discussion on target and the process on schedule. The facilitator must be well trained in the DACUM process and must also have great skill in group dynamics.

Because DACUM chart development is a relatively new activity, and because committee members are usually not familiar with its requirements, the facilitator must be able to provide the participants with a solid framework within which to operate.

The facilitator must insist that the participants work within that specific framework. He or she must provide them with criteria, directions, sets of guidelines, and analogies that will help them accomplish their task.

The facilitator must fully understand the DACUM process and ensure that all the important rules are followed. The facilitator must also persuade all members of the committee to actively participate. Perhaps, most important, the facilitator must insist on the development of clear duty and task statements per the job task and task statement criteria. This means the facilitator must be the verb expert, often helping the panel distinguish between duty, task, and step verbs. For example, coordinate as in "coordinate training" is probably a duty verb rather than a task. Only by knowing how to probe in such a situation will the facilitator discover the real situation. On the other end of the verb continuum, verbs such as start in "start mower" or add as in "add oil" represent minute actions and should be recognized as step rather than task verbs.

The big question—WHAT should be taught?

Another very important aspect of the facilitator's job is obtaining appropriate qualifiers for most task statements so that they truly stand alone. While the task "mow the lawn" is quite clear, the task statements "develop a plan" and "assess performance" are not. What type of plan is needed, who are we to assess, and in what area? A committee often has to be asked repeatedly for one or more words which help make the task statement "crystal clear." The facilitator has an extremely important quality control responsibility—making sure the right verbs, qualifiers, and objects are selected.

Primarily, this must be done on the spot, because the work demands continuity and a certain momentum. The facilitator must resolve all issues and provide all the guidance needed within the time limitation of the two days that have been allocated. The facilitator does not have time to research how to solve problems or get another expert's interpretation (unless facilitating as a team), or talk to other curriculum personnel. The facilitator must develop his or her skills, **in advance** and be able to respond to situations in the workshop as they occur.

Role of the DACUM Participants

Committee members in the DACUM process are charged with deciding **what** skills should be taught to students wanting to enter work in their field. Hence, their role is also critical to the successful development of a valid DACUM chart. Although much as already been said regarding member selection, a few additional comments about the significance of their decision-making role may be helpful at this point in the orientation process.

The role of the DACUM participant is a unique one. Individually and collectively, participants are asked to define their jobs in great detail by identifying all of the important tasks they currently perform on the job. The participants are the content experts, and it is they who must discuss, debate, and occasionally even argue about what is really important to their jobs.

Because of their critical role, the quality of the final chart depends to a great extent on the careful choice of the members of the DACUM committee. These people are experts selected from the ranks of incumbent workers in the occupation or direct supervisors of workers—people who are on the job everyday. Of course, they must be experienced, up to date, and knowledgeable individuals, but the DACUM process also requires that they be articulate and able to work in a group setting.

In all decisions regarding the skills involved in the occupation, the participants must be given the **authority to decide**. If the DACUM facilitator tells them they are the experts and carefully listens to them as the analysis proceeds, they will accept the collective decision-making role and produce a good analysis. If, on the other hand, the facilitator says they are the experts and then proceeds to be too directive in the analysis process, he or she will soon lose the cooperation and support of the committee.

Role of Recorder and Observers

The recorder is an assistant to the facilitator whose job is to record the committees contributions, as directed by the facilitator. It is advisable to clearly explain the recorders role to the person fulfilling it before the workshop begins.

The observers' role is to do just that—observe. Observers are not expected or permitted to participate. Assuming the size and layout of the meeting room permits persons to observe the process without undue disruption, observers can increase their knowledge of the DACUM process through such first-hand observation. This opportunity has enabled many institutions and companies to gain and strengthen the support of other instructors, supervisors, and administrators for using the DACUM procedure.

Instructional personnel should be strongly urged, if not required, to be observers at DACUM workshops conducted for their instructional area. As observers they can obtain a valuable technical update about how their instructional area is changing. During breaks and lunches they may interact with the expert workers and, possibly, develop new industry relationships.

Another option is to videotape portions of the workshop. The tape can then be made available, later, for interested instructors, supervisors, and managers. Because some portions of the workshop are likely to be quite repetitive, quality editing can show the highlights of the total procedure on a 30- to 60-minute tape.

Role of Curriculum Developers

The curriculum developer's role is to develop instructional materials based on the DACUM workshop results. It is recommended that the curriculum developer participate as an observer or recorder. Such attendance helps immensely in preparing for the task analysis and curriculum development activities that will follow eventually. See pages 21-22 (SCID Model) in the introduction to this handbook for a listing of the specific tasks usually performed by curriculum developers.

Task D-8. Present DACUM Philosophy and Concepts

It is recommended that several transparencies, a sample DACUM chart, and a list of job task and task statement criteria be used as part of the orientation process. Recommended transparency masters may be found in Appendix A. Four sample DACUM research charts may be found in the pocket of the back cover of this notebook. The **Developing Task Statements** handouts (pages D-31 to D-34) are located at the end of this section.

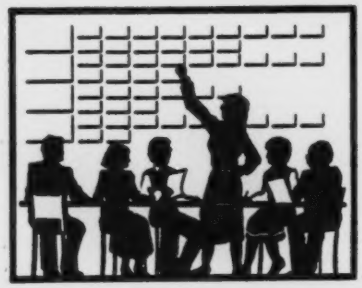
The purpose of this part of the orientation is to present a **brief** overview to review basic DACUM fundamentals. It should focus on **what the committee needs to know to get started,** not on everything they need to know at every subsequent point in the process. Throughout the process, the facilitator will need to reinforce the guidelines already presented, as well as introduce new ones.

With this in mind, a recommended DACUM Orientation Outline (lesson plan) is presented on pages D-27 and D-28. Now each recommended transparency and step in the orientation process will be presented and briefly explained. Supplemental transparencies are listed with brief descriptions on pages D-29 and D-30. Masters for both the recommended and supplemental transparencies are found in Appendix A.

Sample Transparency

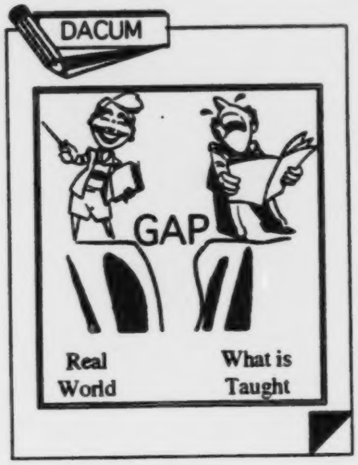
DACUM Cover Ilustration

Use this transparency (TR) to represent the major actors in the DACUM process—the committee of expert workers and the facilitator. It also graphically portrays use of the wall to display the duties and tasks identified. An excellent and meaningful transparency to begin with.



The Gap

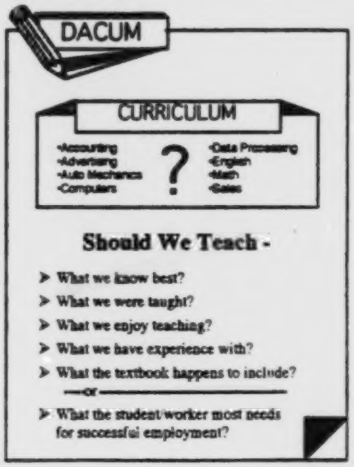
Use this TR to point out the considerable gap between **what is being taught** in our schools, colleges, and industry training programs, and **what is happening in the real world**. This gap is both serious and costly. Curriculum developers and program administrators must do everything possible to reduce this gap because it hurts everyone involved.



Curriculum

Use this TR to briefly point out ways in which curriculum has traditionally been determined. The first five ways listed, "what we know best, etc." represent poor and generally unacceptable ways of deciding on occupational and industry-based curriculum. Stress that it is more effective to determine "what the student/worker needs for successful employment" Making a defensible decision about **what** should be taught requires careful analysis.

Sample Transparency



DACUM

CURRICULUM

•Accounting
•Advertising
•Auto Mechanics
•Computers
?
•Data Processing
•English
•Math
•Sales

Should We Teach -

- ➢ What we know best?
- ➢ What we were taught?
- ➢ What we enjoy teaching?
- ➢ What we have experience with?
- ➢ What the textbook happens to include?

—or—

- ➢ What the student/worker most needs for successful employment?

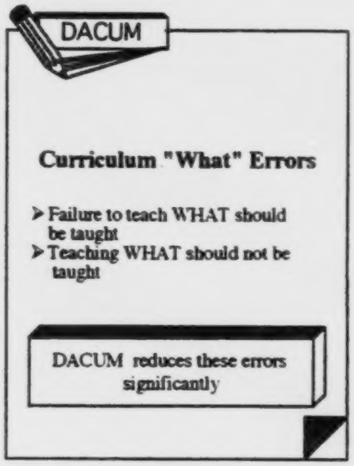
Curriculum "What" Errors

Use this TR to point out the two major kinds of errors associated with curriculum development:

(1) **Failing to teach what should be taught.** This means leaving out the latest skills, knowledge, methods, and processes being used by business and industry.

(2) **Teaching what should not be taught**. You may refer to as the "old yellow notes" syndrome.

Combined, it is frequently estimated by curriculum experts that the percentage of curriculum that is irrelevant may be 50% or higher.



DACUM

Curriculum "What" Errors

- ➢ Failure to teach WHAT should be taught
- ➢ Teaching WHAT should not be taught

DACUM reduces these errors significantly

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What is DACUM?

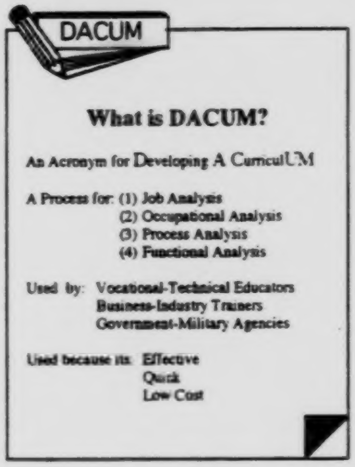
Define the acronym. Explain the difference between job analysis (single job) and occupational analysis (multiple related jobs). Explain process analysis, which involves an analysis by several different categories of workers who cooperatively carry out an important process or sub-system of work.

Major users include:

Secondary-Postsecondary Educators - 40%
Business-Industry Trainers - 40%
Government-Military Trainers - 20%

Stress why DACUM is so popular - it is effective, quick, low cost, a potent combination. Ask if there are questions.

Sample Transparency



DACUM

What is DACUM?

An Acronym for Developing A CurriculUM

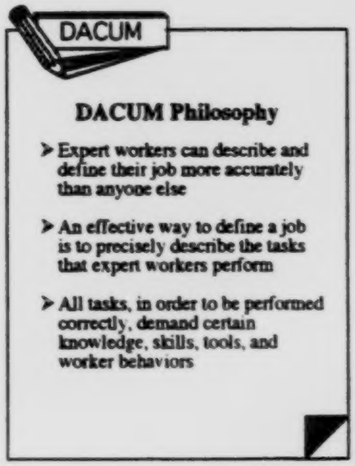
A Process for: (1) Job Analysis
(2) Occupational Analysis
(3) Process Analysis
(4) Functional Analysis

Used by: Vocational-Technical Educators
Business-Industry Trainers
Government-Military Agencies

Used because its: Effective
Quick
Low Cost

DACUM Philosophy

Describe the three points and explain their meaning. Point out that the first assumption is very hard to dispute. The second statements means that through the DACUM process, the committee will be describing exactly what they do. The third assumption refers to the many related things that enable the worker to perform successfully. The information referred to in both the second and the third statements will be identified by the expert workers.



DACUM

DACUM Philosophy

- ➤ Expert workers can describe and define their job more accurately than anyone else
- ➤ An effective way to define a job is to precisely describe the tasks that expert workers perform
- ➤ All tasks, in order to be performed correctly, demand certain knowledge, skills, tools, and worker behaviors

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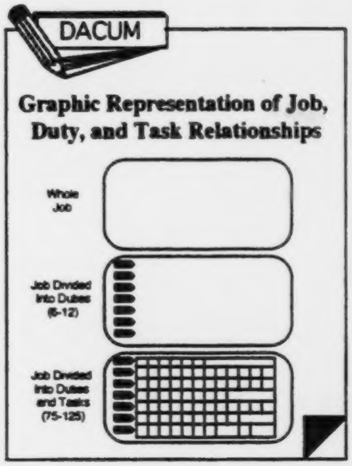
Task D-9. Review High Quality Sample DACUM Chart

Graphic Representation of Job, Duty, and Task Relationships

Use this transparency to help the committee conceptually understand what the job/occupational analysis process is all about. Explain each part of the graphic. Indicate that the range of duties (6-12) and range of tasks (75-125) that are true for most occupations, but occasionally there are exceptions.

Sample Transparency


DACUM
Graphic Representation of Job, Duty, and Task Relationships
Whole Job
Job Divided Into Duties (6-12)
Job Divided Into Duties and Tasks (75-125)

Review Sample, High Quality, DACUM Chart

At this point, you should turn off the overhead projector, return lights to normal if they have been dimmed or reduced, and **hand out a sample, high quality DACUM chart.**

Explain that this is an example of what the committee will be producing over the next two days. Then, carefully walk them through all of its features as follows:

On the front:
- title of the job/occupation
- names of the expert workers, their companies/agencies, and cities
- name(s) of the DACUM facilitator(s)
- sponsor and/or developers
- dates workshop was conducted

Sample Transparency

On the outside:

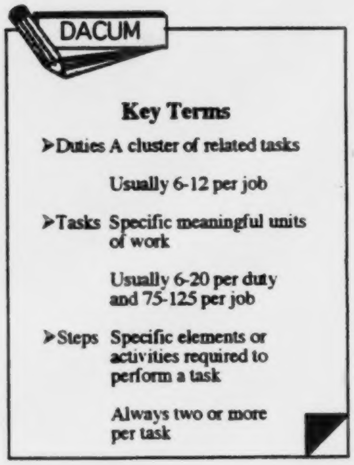
- **job duties** located in a column on the left hand side of chart. Review two or three duties word for word pointing out that they start with a verb, contain an object and usually a qualifier.
- **job tasks** located in rows behind each duty. As with the duties, review two or three tasks while carefully pointing out the verbs, objects, and qualifiers.

On the back:

- **general knowledge and skills**. Point out these are important as they are enablers for many, if not all, of the tasks.
- **worker behaviors**. These traits and attitudes are extremely important because they support task performance.
- **tools, equipment, supplies, and materials**. These also are essential to task performance.
- **future trends/concerns**. These factors indicate how the job may change.
- **acronyms.** These may be considered optional, but be sure to include those that are likely to come up during the workshop.

Key Terms

This transparency briefly defines commonly used duties, tasks, and steps, and important terms pertaining to the DACUM process. As you explain each term, provide an example to help illustrate the meaning.



DACUM

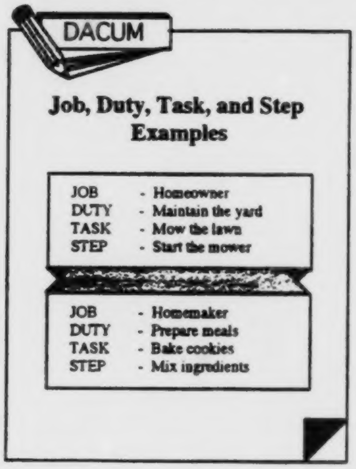
Key Terms

➤Duties	A cluster of related tasks Usually 6-12 per job
➤Tasks	Specific meaningful units of work Usually 6-20 per duty and 75-125 per job
➤Steps	Specific elements or activities required to perform a task Always two or more per task

Job, Duty, Task, and Step Examples

Use these two examples to help further explain the differences in terminology. This is a good place to involve your committee in identifying other examples. For example, you can ask "what other duties must be performed around the home," "what other tasks are involved in maintaining the yard," and so on. You may also find it helpful to review these examples later in the workshop.

Sample Transparency


DACUM

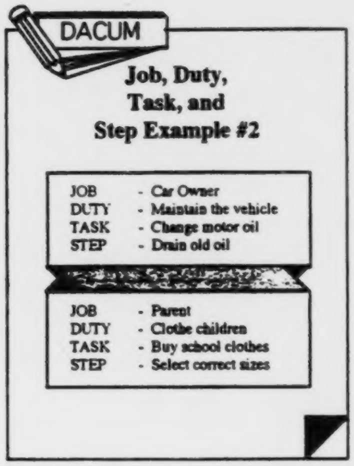
Job, Duty, Task, and Step Examples

JOB - Homeowner
DUTY - Maintain the yard
TASK - Mow the lawn
STEP - Start the mower

JOB - Homemaker
DUTY - Prepare meals
TASK - Bake cookies
STEP - Mix ingredients

Job, Duty, Task, & Step Examples #2

Use these additional examples as alternates if you prefer or if they seem suited to your particular audience. Be sure to ask your expert workers for other possible car owner and parenting tasks and steps.


DACUM

Job, Duty, Task, and Step Example #2

JOB - Car Owner
DUTY - Maintain the vehicle
TASK - Change motor oil
STEP - Drain old oil

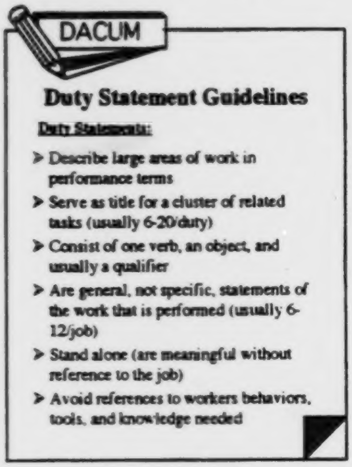
JOB - Parent
DUTY - Clothe children
TASK - Buy school clothes
STEP - Select correct sizes

Task D-10. Teach Committee Members to Compose Duty and Task Statements

Duty Statement Guidelines

Use these guidelines, along with some "everyday" examples familiar to your DACUM committee. Usually sample duties such as "Maintain the Yard," "Maintain the Home," "Maintain the Car," "Care for Children," or "Prepare Meals" help the expert workers to quickly understand the difference between duties and tasks, even though they have the same components.

Sample Transparency



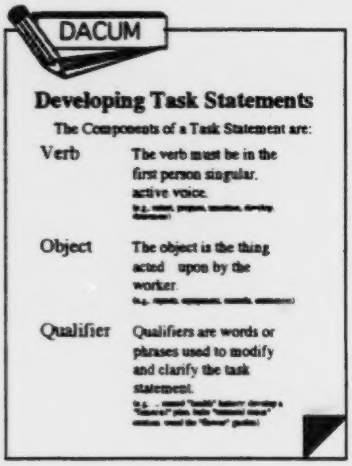
Duty Statement Guidelines

Duty Statements:

- Describe large areas of work in performance terms
- Serve as title for a cluster of related tasks (usually 6-20/duty)
- Consist of one verb, an object, and usually a qualifier
- Are general, not specific, statements of the work that is performed (usually 6-12/job)
- Stand alone (are meaningful without reference to the job)
- Avoid references to workers behaviors, tools, and knowledge needed

Developing Task Statements

This transparency emphasizes and clarifies what you illustrated, by example, about tasks when you reviewed the sample DACUM chart. The expert workers must understand the three basic parts of most task statements. Very few statements are as clear as they should be without a qualifier. The example of "develop a plan" illustrates very well the need for a qualifier. Again, this is a good time to involve the committee in a discussion of task components and examples. This is the point at which to distribute and briefly review Developing Task Statements on pages D-31 to D-34.



Developing Task Statements

The Components of a Task Statement are:

Verb	The verb must be in the first person singular, active voice.
Object	The object is the thing acted upon by the worker.
Qualifier	Qualifiers are words or phrases used to modify and clarify the task statement.

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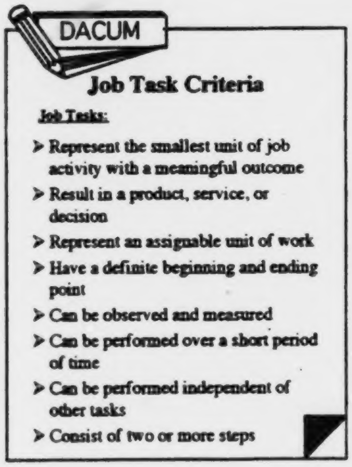
Sample Transparency



DACUM

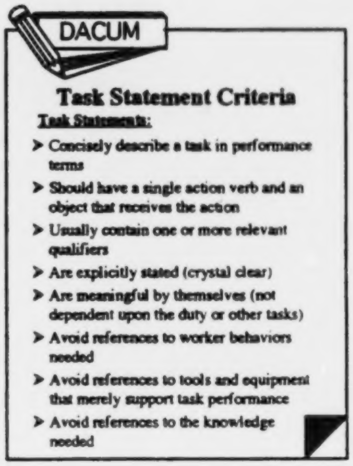
Job Task Criteria

Job Tasks:

- ➤ Represent the smallest unit of job activity with a meaningful outcome
- ➤ Result in a product, service, or decision
- ➤ Represent an assignable unit of work
- ➤ Have a definite beginning and ending point
- ➤ Can be observed and measured
- ➤ Can be performed over a short period of time
- ➤ Can be performed independent of other tasks
- ➤ Consist of two or more steps

Job Task Criteria

As you reveal these job-task criteria one-by-one, explain that these are the criteria used to decide whether you have an actual job task or not. The job activity under consideration must meet **all** of the criteria to be considered a task. As you review each criterion, give a brief but clear example of what it means. To simply review all of the items without providing clear examples is not very helpful. The actual identification of worker tasks in a high quality manner is a major part of any DACUM workshop. Therefore, a solid understanding of the criteria by the facilitator and some understanding by the committee of expert workers are crucial to successful facilitation.



DACUM

Task Statement Criteria

Task Statements:

- ➤ Concisely describe a task in performance terms
- ➤ Should have a single action verb and an object that receives the action
- ➤ Usually contain one or more relevant qualifiers
- ➤ Are explicitly stated (crystal clear)
- ➤ Are meaningful by themselves (not dependent upon the duty or other tasks)
- ➤ Avoid references to worker behaviors needed
- ➤ Avoid references to tools and equipment that merely support task performance
- ➤ Avoid references to the knowledge needed

Task Statement Criteria

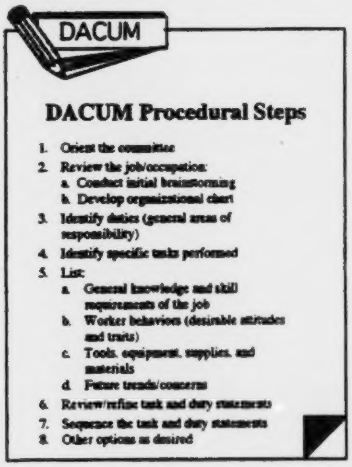
Once the facilitator and DACUM committee decide that they have an actual job task, it must be written in acceptable task statement form. Effective and consistent use of the **task statement criteria** will help you and your committee develop high quality statements that meet widely accepted standards. As with the job task criteria, it is recommended that you reveal and briefly explain the task statement and criteria one by one. Some committee members may have concerns about the three "avoids". Usually, such concern disappears when you explain that a separate list of each of those items will be developed during the workshop. At this point, ask whether committee members have any questions about the nature of tasks.

Task D-11. Present the DACUM Procedural Steps

DACUM Procedural Steps

This transparency presents an overview of the major steps of the DACUM process from start to finish. Review and briefly explain each step and tell the committee you will explain each step in greater detail as you come to it. This overview gives the workers a glimpse of the well-thought-out DACUM process as a whole. Stress that when the process is followed carefully and thoroughly, the high quality results are well worth the effort.

Sample Transparency



DACUM

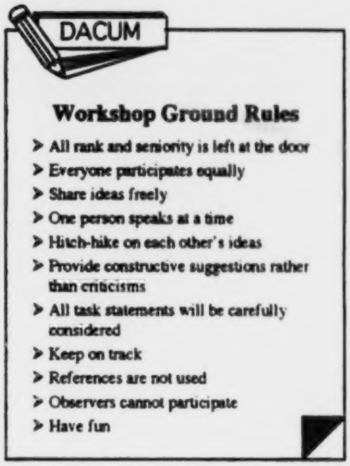
DACUM Procedural Steps

1. Orient the committee
2. Review the job/occupation:
   a. Conduct initial brainstorming
   b. Develop organizational chart
3. Identify duties (general areas of responsibility)
4. Identify specific tasks performed
5. List:
   a. General knowledge and skill requirements of the job
   b. Worker behaviors (desirable attitudes and traits)
   c. Tools, equipment, supplies, and materials
   d. Future trends/concerns
6. Review/refine task and duty statements
7. Sequence the task and duty statements
8. Other options as desired

Task D-12. Explain the Workshop Ground Rules

Workshop Ground Rules

This last transparency recommended for use with most DACUM committees is an explanation of how the facilitator and committees lists a set of ground rules that will help the facilitator and committee of experts work together cooperatively and effectively. Although these ground rules reflect good common sense, it is a good idea to review them one by one. Make sure they are clear to everyone. It is better to establish these ground rules for operation **before** the DACUM process than to introduce them **after**.



DACUM

Workshop Ground Rules

- All rank and seniority is left at the door
- Everyone participates equally
- Share ideas freely
- One person speaks at a time
- Hitch-hike on each other's ideas
- Provide constructive suggestions rather than criticisms
- All task statements will be carefully considered
- Keep on track
- References are not used
- Observers cannot participate
- Have fun

Task D-13. Conduct a Consensus Seeking Exercise

This is an optional activity. Some facilitators like to take a few minutes at this point to conduct a "warm-up' consensus-seeking activity. The facilitator can decide whether such an exercise would be valuable for a particular committee. This is often unnecessary because most committee members will have been involved in various committee assignments or served as members of work teams where some group consensus had to be obtained before work could proceed. This type of activity prolongs the orientation process and may be considered insulting by some persons unless very carefully handled.

Task D-14. Describe Planned Follow-up Activities

Before the workshop begins, the facilitator should consider what follow-up activities are necessary or desirable. This includes deciding whether task verification, task analysis, and other curriculum development procedures will follow, and who is likely to be involved.

If a question arises about what will be done next with the chart, it is appropriate for the facilitator to explain what verification procedures are planned and how that process could result in the modification, addition, or deletion of some task statements.

Also, the institution may want to identify occupational experts from among the DACUM participants who can also serve as subject-matter experts for later task analysis work or to assist with a training program to be developed or updated. These persons could help with the further development of the curriculum and/or be called in as industry experts for the classroom or laboratory presentations.

DACUM Committee Member Data

Please PRINT all of the requested information.

Name ______________________________

Title ______________________________

Company/Facility ______________________________

Mailing Address ______________________________

City/ State/ Zip ______________________________

Phone (______) ______________________

Fax (______) ______________________

Number of years you have worked in this position: ______________________

Supervisor's Name ______________________________

Title ______________________________

Mailing Address ______________________________

City/ State/ Zip ______________________________

Would you like to have a copy of the DACUM chart produced and a thank you letter sent to your supervisor? Yes _____ No _____

Please return this form to the recorder. Thank you.

DACUM Orientation Outline

This outline is a reiteration of some of the topics in the section of the handbook on orienting the participants. It may be useful as you prepare your own notes for the orientation process.

A. DACUM sponsor or host introduces welcoming official

- Welcome committee members officially.
- Thank committee members for their participation.
- Recognize importance of their occupation and assistance.

B. Host introduces facilitator

- Acknowledge that considerable skill is required.
- Review facilitators qualifications/experience.

C. Facilitator takes over workshop

- Extend personal greeting and distribute agenda.
- Ask each committee member to introduce self.
- Introduce recorder and observers/instructor(s), if any.
- Use ice-breaker activity, if desired.
- Create informal, relaxed atmosphere.
- Review logistical arrangements (e.g., location of restrooms, meeting times, break procedures).

D. Facilitator establishes rapport

- Ask members to remove ties, coats, etc., to get comfortable.
- Congratulate them on being selected and recognized as experts.
- Confess his or her lack of occupational expertise.
- Express his or her enthusiasm for the DACUM process.
- Review his or her successful experiences.
- Explain briefly the job to be done.

- Ask agency official representative to explain how the host institution/agency will use the resulting analysis.

E. **Begin explanation of DACUM**

- Explain acronym.
- Explain what DACUM is and how it has been used.

F. **State the philosophy behind DACUM**

- Use transparency to present three assumptions.
- Ask for questions, explain as necessary.

G. **Summarize roles of committee and facilitator**

- Emphasize **process** skills of facilitator.
- Emphasize **content** expertise and decision-making skills of panel members.

H. **Review the nature of duty and task statements**

- Explain the nature of duty and task statements.
- Distribute handout task components and criteria.

I. **Explain DACUM procedural steps**

- Use transparency to review the eight steps.
- Distribute and review a sample DACUM chart to illustrate what a completed chart looks like. Stress use of action verbs, objects, and qualifier.
- Ask if there are questions.

J. **Explain ground rules for committee operation**

- Use transparencies.
- Ask if there are questions.

K. **Conduct review of occupation and begin identification of duties**

- Develop an organizational chart.
- Identify duties (general areas of competence).

Supplemental Transparencies

In addition to the transparencies recommended for use in every orientation, there are a few others that facilitators may want to use selectively with various groups. The titles of these transparencies follow along with brief explanations.

Most Important Question	Self-explanatory
Oral Questioning Skill	Self-explanatory
Some Task Statement Guidelines	These are very important for the facilitator to internalize and practice during workshops. It is especially important to be specific.
Things To Avoid	These should be remembered and avoided whenever possible.
Things That Help	These should be remembered and implemented as appropriate.
DACUM Standards	These factors reflect the criteria considered essential to obtaining a high quality analysis.
The DACUM Components	These three very important components describe the DACUM process as defined by the author and many others. Common reference to DACUM in the field often refers only to the job analysis workshop.
Major DACUM Workshop Outcomes	This lists the five and sometimes six outcomes of any high quality DACUM workshop.
DACUM Advantages	This can be used to explain why DACUM is such a powerful process when compared to the interview/observation and other procedures.

DACUM Process	This describes the benefits of the DACUM process as summarized by General Motors trainers upon the completion of 26 workshops for career planning and development purposes.
Some Company Users	This identifies some of the better known companies in the United States and Canada who use the DACUM process.
Some University Users	This presents a listing of some of the many universities who have used DACUM in one or more program areas.
Some Country Users	Many countries have hosted DACUM Institutes and/or sent key persons to the United States for facilitator training.
DACUM Enables Schools and Colleges to--	This list describes **some** of the many ways that DACUM can provide substantive help to schools and colleges
DACUM Enables Business and Industry to--	This identifies **some** of the many ways that business and industry have used DACUM successfully.
What Should Be Taught	This can be very effective when used with a group that is considering the DACUM process to emphasize the importance of carefully deciding what to teach.
DACUM Terms and Relationships	This graphically portrays how two or three jobs make up an occupation and how each job is comprised of several duties, many, many tasks, and hundreds of steps and enablers.
Job and Task Analysis	These components of the analysis phase of curriculum development are very different as this illustration depicts.

DEVELOPING TASK STATEMENTS

The Components of a Task Statement are:

Verb	**The verb must be in the first person singular, active voice.** (e.g., select, prepare, maintain, develop, determine)
Object	**The object is the thing acted upon by the worker.** (e.g., reports, equipment, records, customers)
Qualifier	**Qualifiers are words or phrases used to modify and clarify the task statement.** (e.g.,. . . record "health" history; develop a "financial" plan, bake "oatmeal raisin" cookies, weed the "flower" garden)

JOB TASK CRITERIA

Job Tasks:

- Represent the smallest unit of job activity with a meaningful outcome
- Result in a product, service, or decision
- Represent an assignable unit of work
- Have a definite beginning and ending point
- Can be observed and measured
- Can be performed over a short period of time
- Can be performed independent of other tasks
- Consist of two or more steps

TASK STATEMENT CRITERIA

Task Statements:

- Concisely describe a task in performance terms
- Should have a single action verb and an object that receives the action
- Usually contain one or more relevant qualifiers
- Are explicitly stated (crystal clear)
- Are meaningful by themselves (not dependent upon the duty or other tasks)
- Avoid references to worker behaviors needed
- Avoid references to tools and equipment that merely support task performance
- Avoid references to knowledge needed

EVERYDAY EXAMPLES OF JOBS, DUTIES, TASKS, AND STEPS

JOB - Home Owner
DUTY - Maintain the Yard
TASK - Mow the Lawn
STEP - Start the Mower

JOB - Homemaker
DUTY - Prepare Meals
TASK - Bake Oatmeal-Raisin Cookies
STEP - Mix Ingredients

JOB -
DUTY -
TASK -
STEP -

Duty E—Manage the Group Process

Task E-1. Control Group Pace E-2

Task E-2. Resolve Group Conflicts/Concerns . E-3

Task E-3. Direct the Group's Focus E-4

Task E-4. Enforce Rules for Observers E-4

Task E-5. Balance Committee Participation . . E-5

Task E-6. Reinforce Productive Behavior Contributions E-6

Task E-7 Deal with Disruptive or Unproductive Committee Members E-7

Task E-8 Probe with Questions E-8

Task E-9 Evaluate Progress of Workshop E-9

Task E-10 Coordinate Hospitality Functions . E-10

Task E-11 Terminate Unproductive Session . . E-10

Two major responsibilities must be dealt with **concurrently** as the next phase of the DACUM workshop begins. Immediately following the orientation to DACUM, you must simultaneously begin facilitating group interaction **and** constructing the DACUM chart itself.

Duty F of this handbook describes in detail each of the major steps involved in constructing the DACUM chart. This section addresses the **facilitator skills** needed to manage the group process while helping the committee construct their DACUM chart. Quite different skills are needed at different times in this process. A facilitator first needs a good repertoire of skills to draw upon and then the ability to judge when to use these skills.

As a DACUM facilitator, you must cultivate and use many interpersonal communication skills. Basically, the DACUM process requires you to guide the participation and interaction of committee members in a specific sequence through brainstorming and consensus-seeking activities. At the same time, you must enforce the ground rules of brainstorming and adhere to the basic principles of DACUM. DACUM is a dynamic and synergistic process, but it requires firm and knowledgeable leadership.

Because as a facilitator, you will be responsible for facilitating many small-group brainstorming sessions, the rules for productive brainstorming during a DACUM workshop are summarized here.

The facilitator should:

- Encourage each committee member to contribute.
- Listen actively to all contributions.
- Control participants who try to dominate.
- Readily accept as many contributions as possible.
- Avoid criticizing participants' contributions.
- Verbalize contributions to ensure accuracy and clarity.
- Provide frequent positive reinforcement.
- Repress your own biases and opinions.
- Probe and encourage with questions.
- Set and maintain an enthusiastic climate.

The committee members should be encouraged to:

- Offer contributions freely.
- Share ideas among themselves.

- Help one another offer statements.
- Withhold judgments about the contributions of others.

The tasks in this section discuss many but not all of the skills you will need at various times in order to function effectively as a DACUM facilitator. The facilitator must always be patient, demonstrate confidence and enthusiasm toward the DACUM process, and exhibit sensitivity and sincerity toward the committee members. You must quickly establish rapport and build a trusting relationship with each committee member. The leadership style you exhibit will strongly influence the group process and outcomes of the workshop.

Task E-1. Control Group Pace

The DACUM facilitator needs to set and maintain a steady and productive work pace. If the committee fails for a long period to identify any new duties or tasks, some members of the committee may feel that the group is hopelessly bogged down.

At times, you will need to briefly reorient the committee and reassure them that the process really works. A facilitator may temporarily accept some poorly worded statements just to "get the ball rolling" again. Avoid allowing the participants to debate endlessly the worth of each statement offered.

Effective facilitators can stimulate a good work pace by setting an example. If the facilitator responds immediately to statements (e.g., body language will usually indicate when there is wide acceptance) and quickly places the written statement on the wall, members tend to respond more rapidly. A facilitator may also stimulate a quicker pace by calling on members by name for tasks that they may seem to be withholding for some reason.

If everyone seems fatigued or restless, it may be time to suggest that the participants take a break. You should always be aware of the room temperature and ready to make or request climatic adjustment. No one can contribute his or her maximum in a room that is too stuffy, too hot, or too cold.

Task E-2. Resolve Group Conflicts/Concerns

When disagreements and differences arise regarding duties or tasks, the facilitator must resolve the conflict through compromise, if possible. Your role becomes that of a mediator who must be both firm and fair.

Disagreement will occasionally arise over choice of the best action verb or most appropriate qualifier or object. If two members argue over a particular word choice, another member of the committee may be able to suggest wording that satisfies both. Sometimes it is best to place both definitions on adjacent cards that are marked to indicate that the definition must receive further attention. Placing the cards at any angle or in the "parking lot" (area to the left of the duties) usually works very well. Return to these items several hours later, after emotions have cooled down. Quick resolution is usually possible.

Strong emotions can enter into the process as the members begin to claim ownership of the chart and want to see it "perfected" from their personal viewpoints. At such a time, you may need to remind the participants that the art of compromise is essential to DACUM committee work.

Task E-3. Direct the Group's Focus

As Kenny Rogers sings in **The Gambler**, "You got to know when to hold 'em; know when to fold 'em; know when to walk away; know when to run." Likewise, as the discussion leader, your major task is to guide and keep all members of the committee involved in a constructive manner. On occasion, different and sharply opposing views and philosophies may surface. The facilitator should allow members to disagree without being disagreeable. Once differences have been vented, an effective facilitator will try to elicit a compromise, or at least an understanding, among the committee members involved.

As the facilitator, you will also need to be the "taskmaster" (no pun intended)—keeping discussions well focused and starting the workshop on time initially and after 15-minute breaks and lunches. Allowing 30-minute breaks and too many irrelevant discussions, can make it nearly impossible to complete all necessary work.

Allowing the committee to wander or vent their feelings on some issue for a short time can be useful and even allows the facilitator to be positively empathetic. Too much wandering and too many "hot" debates, however, can cause the group to lose its focus and sense of accomplishment.

Task E-4. Enforce Rules for Observers

As the workshop gets underway, you may find that you will occasionally have to enforce the no participation rule for observers. You might mention the rule at an early stage, telling committee members not to expect any help or participation from observers. Some facilitators jokingly suggest that they have some wide duct tape in their supply kit should it be needed. From time to time it may become necessary to remind an observer of his or her role, but serious problems are rare.

Task E-5. Balance Committee Participation

The facilitator must promote free and nonthreatening discussions by every member of the committee. If individuals are not contributing, the facilitator must attempt to draw them out by calling on them by name or by asking for their reaction to a statement. Some members may feel their competence is not equal to that of other members of that group, and thus withdraw. The act of extracting one or two tasks or reactions from such persons fairly early in the process will do much to encourage their fuller participation throughout the workshop.

In addition to calling upon the quieter members, you may also have to politely, but firmly, control dominant members by interrupting or sometimes ignoring them. If two persons speak at about the same time, it may be useful to pick up on the message of the quieter member. Or the facilitator may say, "George, we've already heard from you, what do the rest of you think?" and proceed to call on other members by name.

Appropriate body language can also be used very effectively to both draw out quieter members and quiet down the outspoken ones. For example, walking directly up to a committee member while gently smiling and maintaining direct eye contact tells the individual that you want to hear from him or her even without the use of the person's name. Use of the person's name in a friendly tone of voice on top of the other body language will almost compel the person to speak.

When you have a person who is talking too much, you can turn your back, at least partially, to that individual if the person is sitting on either side. In extreme cases, it also works to look at other members of the committee while using your extended hand to indicate for the offender to "be quiet."

A facilitator must effectively "control" the discussion so that the needed information can flow smoothly. Sometimes a humorous remark may be used to tell a dominating type to back off and give others a chance. Appropriate use of humor can be very therapeutic by releasing everyone's tensions.

Task E-6. Reinforce Productive Behavior Contributions

Reinforcement techniques are another of the powerful tools available to any DACUM facilitator. Reinforcement techniques are of two types—positive and negative—and both may be effectively used during the workshop. Examples of **positive reinforcement** include:

- Praising individual members for their contributions
- Asking individuals for their personal reaction to a statement or to explain a specific term or concept
- Acknowledging the participants' expertise
- Acknowledging the excellent progress made
- Remembering and using first names
- Asking individuals how their company does something
- Mentioning an individual member's contribution
- Demonstrating a sincere interest in the occupation

There are also occasions when it is appropriate to use **negative reinforcement** techniques:

- Ignoring critical comments
- Selectively acknowledging only relevant contributions
- Tactfully interrupting rambling discussions
- Humorously rejecting off-the-wall discussions

- Challenging the speaker to put a contribution into performance terms
- Using appropriate body language to reflect disapproval

Task E-7. Deal with Disruptive or Unproductive Committee Members

Occasionally, facilitators have to deal with disruptive members. The best approach is to use good common sense. An effective facilitator responds to concerns in a clear, sincere manner, using a confident tone of voice. Never attempt to punish or ridicule a participant, especially in front of his or her peers. At the same time, the facilitator cannot allow members to get on "hobby horses," which serve only to delay and disrupt the process. Sometimes peer pressure can be used effectively to keep a disruptive member in line.

On occasion, when one or more members feel the DACUM process simply will not work, the facilitator should ask the objector(s) to sit back and observe quietly while the rest of the committee goes ahead. Once the objectors see that the process really does work, they usually want in on the action and may thereafter become effective contributors.

Another option that may work is to declare a brief recess or break so as to confer with the disruptive individual privately. If a personal conference does not resolve the issue, it may be necessary, in unusual circumstances, to ask the person to leave the group. The facilitator must make the separation as painless as possible, but it is important to take such drastic action if the workshop is otherwise doomed to failure.

Appendix F contains a list and discussion of twenty-three specific problems that facilitators may encounter in working with DACUM committees. Most of these are not serious and can easily be managed by the trained facilitator.

Task E-8. Probe with Questions

Good advice for any DACUM facilitator is to probe, probe, and probe some more. The basic question that needs to be asked over and over is—What do you **do**? Of course, this question should be asked in a variety of forms such as:

> What would I see you **doing**?
> What did you do last **week**?
> What else do you have to do?
> What do you do first each day? Last?
> What work do you like most? Least?

Avoid questions pertinent to why and how something is done. You want to **identify all of the tasks that the expert workers perform**. Put another way, you need to find out **what they do** that allows them to be so successful.

A skilled facilitator quickly learns to follow up on member contributions by probing for clarification or further details. Probing improves the quality of the chart and encourages the committee members to share their ideas in depth.

Ask questions of individual members to cause them to expand upon their comments. "Could you say more about that?" "Is that the terminology commonly used by other workers?" "How often is that task performed? How difficult is it to perform?" The main point for the facilitator to remember here is to pose questions in a sincere and nonthreatening manner.

A facilitator also frequently needs to ask questions of the entire committee. "What other duties do successful workers perform?" "What other skills does the worker need?" "Have we specified all the tasks appropriate to this area?" "In what sequence are these tasks usually performed?" Because of the nature of the DACUM process, an effective oral questioning technique is an essential tool for any facilitator.

Task E-9. Evaluate Progress of Workshop

As the workshop progresses, you as the facilitator and group leader must gauge the amount of work accomplished, and if necessary, step up the pace. It is certainly acceptable to finish early on the second day if all of the recommended procedures have been completed. It is not acceptable, however, to reach 5:00 p.m. on the second day without having completed task review and refinement or developing the four recommended lists.

Some general guidelines include:

a. Keep introductions and orientation to one hour or less.
b. Attempt to identify all the duties and to delineate one duty before lunch the first day.
c. Complete delineation of at least four duties the first day.
d. If progress was slow the first day, ask the committee if they can start earlier the second.
e. Consider shortening the lunch hour, if necessary.
f. Split the group into two subcommittees to develop the four lists, then seek whole-group input.

Be sure to pace the workshop so that there is plenty of quality time to review, refine, and sequence all of the duty and task statements.

Task E-10. Coordinate Hospitality Functions

When you are asking expert workers to give up two days of their valuable time, you need to be a good host. Be prepared upon their arrival to provide parking permits or special parking instructions. Be sure to have plenty of hot tea and coffee (and condiments) available. The addition of juice, pastries, or bagels and cream cheese makes a nice and much appreciated continental breakfast. Throughout the day, keep fresh coffee and tea on hand, serve a light but good lunch, and have soft drinks and fruit or cookies available mid-afternoon. Be prepared to accommodate any special dietary needs that were requested in advance.

Other hospitality concerns include providing comfortable seating behind tables, a room at the appropriate temperature and with good ventilation and lighting, and relative quiet. Paying attention to these hospitality functions before and during the workshop can pay big dividends and greatly affect the outcomes of your workshop.

Task E-11. Terminate Unproductive Session

Despite a facilitator's best efforts in advance planning and committee member orientation and selection, it occasionally becomes necessary to terminate a workshop if a committee is unable to handle the job. This skill is one that facilitators may need at some point in time. Of course, every effort should be expended so that this drastic step does not have to be taken.

It has happened that persons selected (or sent by an employer), once they discover what the workshop is about, have become antagonistic or realized that they are simply unqualified to perform the analysis. To "prolong the agony," would only cause further alienation and frustration without helping the curriculum development effort. In such circumstances, it is best to bring the committee activity to a halt and, with the approval of the institutional host, disband the committee in as pleasant a manner as possible.

Duty F—Facilitate Chart Development

Task F-1. Conduct Brainstorming of the Whole Occcupation F-1

Task F-2. Conduct a Job, Occupational, Process, or Functional Area Review F-2

Task F-3. Elicit Duty Statements F-4

Task F-4. Obtain Consensus on Initial Sequencing of Duty Statements F-4

Task F-5. Conduct Brainstorming to Elicit Task Statements F-7

Task F-6. Obtain Consensus on Task Statements F-7

Task F-7 Reintroduce Unresolved Contributions F-11

Task F-8 Elicit List of General Knowledge and Skills F-12

Task F-9 Elicit List of Worker Behaviors . . . F-13

Task F-10 Elicit List of Tools, Equipment, Supplies, and Materials F-14

Task F-11 Elicit Lists of Future Trends/Concerns F-15

Task F-12 Identify List of Acronyms and Their Meanings F-15

Task F-13 Review Initial Brainstorming Lists . F-16

Task F-14 Refine Duty and Task Statements . . F-16

Task F-15 Sequence Task Statements F-19

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Task F-18 Conduct Final Review of Chart . . . F-21

Task F-19 Code Task and Duty Statements . . . F-24

Task F-20 Administer Committee Evaluation of Workshop F-25

Task F-21 Arrange for Recognition and Publicity F-26

Resources:

DACUM Verb List F-29
DACUM Workshop Evaluation F-31

At this point, the facilitator starts to apply all of his or her DACUM facilitation skills in actually constructing the DACUM chart. It is assumed that you have already oriented the committee members and have satisfactorily answered their questions about DACUM. This section begins with information on defining the occupation and its scope and proceeds step-by-step through each of the remaining stages of chart development.

The DACUM committee must be carefully guided by the facilitator through each of the following steps:

1. Review job or occupational area
2. Identify the duties (general areas of responsibility)
3. Identify the specific tasks performed
4. Identify lists of general knowledge and skills, tools and equipment, worker behaviors, and future trends/concerns
5. Review and refine duty and task statements
6. Sequence duty and task statements
7. Other options, as desired

Task F-1. Conduct Brainstorming of the Whole Occupation

You are now ready to obtain direct input from the committee, while at the same time to begin building personal rapport with each expert. Brainstorming the entire job or occupation gives you the opportunity to collect valuable data from every member of the committee that will help you begin to understand their work as well as provide an essential data base for the later identification of duties. You might set the stage this way. You moved in as their next door neighbor two weeks ago. It is Saturday morning and you invited them over for coffee. After telling them what you do, you ask them to tell you what they do.

Start at one end of the group and ask each worker in turn, to give you one work activity. Repeat this a second time until every worker has given you at least two different work activities. Then open up the discussion, allowing anyone to contribute, until such time as you have obtained 4-6 flip chart sheets of information.

As this job brainstorming process unfolds, you may need to remind the committee about the rules of brainstorming—especially that no critique of others' contributions is allowed. As facilitator, you can ask a clarifying question but should **not** provide any evaluative comments. You also need to carefully record exactly what the committee members say. If some comments are too verbose, summarize the comments and ask if your summary is okay. As each flip chart sheet is removed, it should immediately be posted with putty directly in front and center of the committee.

It is important to note that during the brainstorming session, you should begin to understand the committee's job. You should also try to identify some potential duty areas. The committee will identify the duties, but by having a sense of what they may be, you can ask questions that can facilitate their identification.

Task F-2. Conduct a Job, Occupational, Process, or Functional Area Review

Immediately following the brainstorming, conduct a discussion and review of the occupation to be analyzed. The major purpose of this discussion is to clearly establish the parameters of the occupation to be analyzed. Everyone needs to know which jobs or occupational specialties are to be **included** in the analysis and which ones are to be **excluded**.

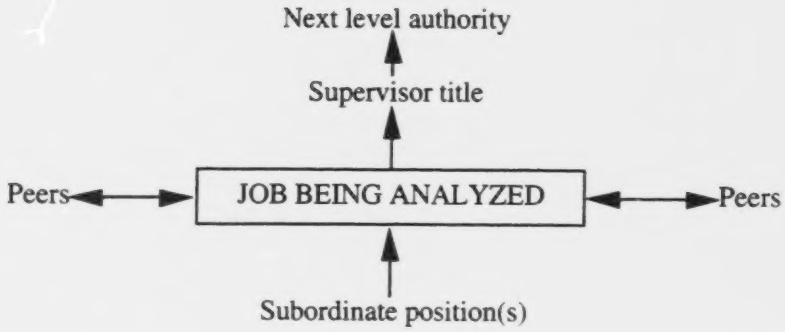
One excellent way to gain clarification is to establish an organization chart on the flip chart. Place the name of the job/occupation being analyzed in the center of the page. Determine if there is agreement on the title and whether there are different levels of the position. Draw a rectangular box around the agreed upon title. Then ask for the title (not the name) of the immediate supervisor. Write it in above the job title. Ask the same for the next level higher, then for their subordinates, and eventually for their peers. Place the peers on either end of the job title box. If customers and/or advisory groups are involved, they should be properly indicated. To close this discussion off, you may want to take a brightly colored felt-tip marker and redraw the boundaries of the job title box and declare that it is the work of the persons "within the box" that needs to be carefully defined.

Another approach to gaining clarification is to ask the hosting institution to prepare a written description of the occupation for which it hopes to prepare students. The institution should already have determined that there is a need for training students in the given occupation, so institutional personnel should also have some idea of the scope of the occupation.

The program administrator and instructor(s) can usually prepare such a starting definition based on their knowledge of the field. Where a new vocational or technical program is proposed, the DACUM facilitator may wish to refer to the **Dictionary of Occupational Titles** (DOT) or the **Occupational Outlook Handbook** (OOH) for a beginning definition.

The facilitator may then request committee members to identify the job titles given by their companies to individuals who work in the occupation under study. Often, different titles are used to describe what is basically the same job. The facilitator may also ask members to identify other job titles in their organizations that reflect related positions at higher and lower levels than the occupation being analyzed.

A chalkboard or flip chart may again be used to illustrate the relationships that exist between jobs within the occupation. The facilitator should not be overly concerned about the quality of the initial occupational definition. The key is to establish an acceptable working definition so that all members of the committee know what job titles are included in the definition and, hence, what duties and tasks should be included in the occupational analysis.



Task F-3. Elicit Duty Statements

Once the participants and facilitator are satisfied that they have agreed upon a working definition of the occupation, they are ready to begin identifying the broad areas of responsibility (duties) of the occupation under which all specific tasks will fit. This is where the facilitator must provide enthusiastic leadership. The committee will, at this point, be unsure of itself and need considerable guidance.

Begin by explaining that a duty is a large area of work, a cluster of at least 6 and as many as 20 related tasks. Duty statements should begin with an action verb, contain an object, and usually a qualifier. The major difference between a duty and a task is in the scope of work involved. This is usually a good time to review the duty and task examples used during orientation.

Then ask your committee to study carefully the information collected during brainstorming of the job. Request that they identify some of the big areas (duties) that may already be there and do some clustering of smaller, but like, activities.

Participants are likely to have difficulty distinguishing between task statements and duty statements. Remind them of the examples—that the duty is to maintain the yard, and one of the 6 to 20 tasks involved in that duty is to mow the lawn. In any event, the goal initially should be to get some, if not all, of the committee members' contributions on paper and up on the wall, even though you know that the wording will change and that some "duty" statements are likely to end up as task statements and vice-versa.

As the duty statements are offered, you need to seek agreement among all committee members. This will usually require some discussion and probing. At this initial stage, you will need to provide guidance as to the nature of good duty statements. Reference to the sample chart distributed during orientation should be helpful. Although six to twelve duty areas are common for most occupations, you should continue to solicit contributions until the participants feel they have exhausted all the possibilities.

Near the conclusion of this phase of the analysis, the facilitator may say, "Can you think of any job tasks that would not appropriately fit under one of the duty statements already on the wall?" The existence of such job tasks suggests that another area is needed. It is helpful to ask the committee to include an action verb as part of each duty statement, as this gets the participants thinking immediately in terms of performance.

It is important for the facilitator to reemphasize several times at this stage that the statements will be refined later. The purpose here should be to elicit from committee members, as quickly as possible, statements that represent duty statements. Taking too long to obtain agreement on statements in large areas of work this early in the process is likely to be counterproductive.

After about an hour of discussion, the facilitator should have listed on the left side of the wall, in a vertical column, most of the duty areas for the occupation. When contributions appear to be exhausted, review the list of statements by reading each one aloud. The facilitator should remind the group again that any duty area that cannot be subdivided into six or more specific tasks should not remain as a separate duty area. Similarly, a single duty area should not be so broadly stated as to include an excessive number of tasks.

Task F-4. Obtain Consensus on Initial Sequencing of Duty Statements

Once the committee is satisfied that all duties have been identified, ask them to tentatively sequence the duties from top to bottom. Emphasize that sequencing is not a prioritization but an arrangement of the duties in a logical, normal work flow pattern. For example, you would **plan** something before **conducting** it, and **evaluate** it after planning and conducting. If two or more duties have no particular order, don't be concerned. This tentative sequencing usually helps the committee see the overall job structure quicker than they would otherwise.

The sample DACUM charts contained in appendix A suggest the types of general areas of responsibility or duty statements desired. Some sample duty statements include the following:

- Perform diagnostic tests
- Maintain welding equipment
- Perform welding processes
- Service the cooling system
- Perform preventive maintenance
- Perform accounting activities
- Prepare written documents
- Continue professional development

One verb rather than two or three should be used to describe the duty area whenever possible. In the case of "Identify and select materials," the verb "identify" is really unnecessary, as one cannot "select" materials unless you can first identify them.

Task F-5. Conduct Brainstorming to Elicit Task Statements

Once the duty areas have been established and tentatively sequenced, you should be ready to focus attention on one duty that is likely to be fairly easy to delineate. Usually, the committee can suggest an area in which a number of tasks can be readily identified.

This step, like that of identifying duty areas, is also primarily a brainstorming activity. It is the major and most critical phase of the DACUM process, because specifying the tasks for each duty area results in the development of the core of the chart. It is around these tasks (which some also refer to as skills or competencies to be achieved) that the instructional program will later be structured.

Begin task identification by selecting a duty and asking the committee to brainstorm that duty. This should be handled much like the initial brainstorming except that the focus is narrower—on one specific duty. Do **not** ask for tasks during the brainstorming, only for work activities. The basic question to ask is "what do you do when working in this duty area?" You may want to ask for volunteer contributions rather than specifically calling on each worker for contributions. Record whatever is offered on one or two sheets of flip chart paper. The same rule of no critiquing of each other's statements applies.

Task F-6. Obtain Consensus on Task Statements

Once brainstorming has been exhausted for the duty, ask the committee to look at the brainstormed material and identify, if possible, tasks that reflect where the work might begin for that duty.

During this phase, the facilitator should emphasize the need for statements that contain an action verb and that clearly reflect observable worker performances, not knowledge, behaviors, skills, or equipment. Statements that are unacceptable may begin as follows:

- know company procedures
- understand purchasing policy
- appreciate quality

If certain knowledge, behaviors, or equipment are needed by the workers, there must be one or more tasks for which they are needed. Instead of tersely rejecting a knowledge or attitude statement, however, the facilitator may respond by saying the following:

- What does the worker do with that knowledge?
- Why does the worker need to know that?
- Why is that attitude important?
- How does the worker use that attitude?

These questions usually encourage the contributor or some other member of the committee to respond by saying "If the worker doesn't know X, he or she can't do Y." This should suggest an observable task statement. If it does not, permit the participants to discuss the task further, so long as they stay on the topic. Remind the committee also that each task statement should begin with the unwritten—but understood—preface, "The worker must be able to . . ." Verbal repetition of the task being delineated may be needed to help maintain the concentration of the group.

As the committee begins to define the first duty area, it is important that the recorder write agreed-upon statements and the facilitator post them as quickly as possible with a minimum of debate and negative comment. As soon as one task has been identified, discussed, and agreed upon, you **immediately** move (while the recorder is writing) to obtain the second task from the list. Some statements will require little or no discussion and everyone will quickly agree, while others will be more difficult to gain consensus on. Some of the time it is best to put "hot" items in the "parking lot"—the area to the left of the duties—and return to them later when emotions have cooled. As you progress through the brainstormed sheet(s), it is best to check off each item once it has been addressed.

It is often helpful to question the committee about the procedures used to perform a task. If different procedures are used, then it is a different task. It is also a different task if different knowledge or skills are involved. For example, if the task for a homeowner is to "wash windows," you should ask whether they are washing outside windows or inside windows. The procedures are quite different, and the situation warrants two task statements if both activities are performed. A qualifier is needed to help make most tasks clear.

You should remind the participants that everything is tentative at this stage, and not to be overly concerned about the precision of each statement. Review and refinement will occur later.

Although the committee members do not need to be too concerned about the quality of the task statements at this point, the facilitator does. An effective facilitator must be an expert at writing good task statements in order to guide the committee. Probably the most **difficult task for most DACUM facilitators** is that of clearly distinguishing between statements that reflect **duties**, **tasks,** and **steps** (the next subdivision). The facilitator must not only be able to make that distinction, but to help the committee understand the differences. This means the facilitator must know the criteria that characterize high-quality **job tasks** and **task statements**. See pages D-31 to D-33 for a list of these criteria.

As the process moves ahead, the better the statements that the participants contribute, the less time that will be required in the review and refinement stage. (For a brief and illustrative narrative on developing good task statements, see Appendix B.)

While delineating a duty area, participants sometimes want to suggest tasks for other areas as well. This tendency should be resisted; trying to focus on more than one duty area at a time causes the analysis process to break down. Similarly, a group will sometimes want to organize or resequence the task statements during the initial identification. You should remind them that intense review and sequencing will occur later on, after all the tasks have been identified. If a specific process is being delineated, however, it may be useful to tentatively arrange the tasks in order to assist the flow of ideas.

When the participants appear to have exhausted all of the tasks for one duty, the facilitator should ask if they are ready to move on. The facilitator should be careful not to cut them off too soon, and should never call for a break in the middle of discussing a duty area. The facilitator can guide the committee in selecting another duty area in which the tasks are likely to be similar to the one just completed.

The committee may bog down when it switches from procedural tasks to analytical or problem-solving tasks. Whenever the committee appears to bog down, you must provide the necessary direction and enthusiasm to keep the process moving. This does **not** mean suddenly switching from a non-directive role where you **do not** suggest verbs, qualifiers, or the wording of tasks, to a directive role where you start telling the committee what their tasks are instead of listening to them.

Continue this process until the group has delineated all duty areas. Because this stage of the DACUM workshop always takes the most time, it can tax everyone's endurance, patience, and adherence to the process. The facilitator must be enthusiastic and maintain control of the group, but should also attempt to interject humor and laughter into the process. As long as the facilitator remains highly motivated and dedicated to the task, the committee is likely to remain so, as well.

Many facilitators have found the following tips helpful for developing good task statements:

- Keep statements precise and short.
- Each statement should stand alone.
- Use terminology common to the occupation.
- Avoid use of double verbs, such as "remove and repair." Use the more inclusive of the two.

- Avoid statements about the knowledge needed.
- Avoid use of unnecessary and flowery modifiers such as correctly, accurately, effectively, as needed, etc.
- Avoid the use of equipment or tool statements that merely support task performance. The use of tools in and of themselves is not a task activity, but a **means** to achieving the work task.
- Avoid statements about worker behaviors (traits and attitudes).
- List a task only once.

The role of the facilitator is to guide the group process. One way of facilitating is to help the DACUM committee find the verbs which most accurately define the activities they perform. One way preferred by the author and many other facilitators is to probe by questioning the committee members until they identify appropriate wording. This can usually be prompted by asking the experts to use the language of the field or trade. Simply ask the committee to think about how workers, supervisors, and managers talk about this activity on the job. To provide some verb ideas, you may also refer them to the many verbs used on the sample DACUM chart distributed during orientation. Caution them, however, to use only verbs that really fit the situation.

Some facilitators like to distribute to the committee a list of recommended verbs such as the one presented on pages F-29 to F-30. The verb list is meant to be suggestive only, as there are usually some unique verbs associated with each occupation.

You should explain to your committee that verbs should be used in a hierarchy. You should ask the committee to avoid using the same verb to describe both a duty and task or step. The verb used to describe a duty should be more general in nature than the verbs used to describe tasks or steps.

Sometimes committee members may be tempted to misuse the verb list by trying to find some type work activity to go with verbs they like, whether they are appropriate to the job or not. At this point, the list is probably counterproductive to a high quality DACUM analysis.

Task F-7. Reintroduce Unresolved Contributions

A good memory is a great asset to any facilitator. It is helpful to remember who offered each statement so that, should a need for clarification arise later in the review process, the facilitator knows on whom to call. You should also try to remember ideas brought up when working on another duty area that were not used because they appeared to belong elsewhere.

Because of the need to focus the committee's attention on one job duty at a time, you should not start posting cards for other duty areas. Some facilitators make a quick note of such tasks, ask the recorder to do so, or record the statement on a card that is then posted to the left of the column of duty statements, for later consideration. Often these temporarily "unused" statements reflect actual worker tasks and become a part of the finished chart.

Task F-8. Elicit List of General Knowledge and Skills

At some point in the process, after the duties have been identified, you should guide the committee in identifying the four important lists of occupational characteristics:

1. General Knowledge and Skills
2. Worker Behaviors
3. Tools, Equipment, Supplies, and Materials
4. Future Trends and Concerns

There is considerable flexibility as to when these lists are identified as long as it is after the identification of the duties and before the refinement of the duties and tasks. Each list will take approximately 15-20 minutes to complete. Some facilitators use the development of these lists as a change of pace, for example, in the hour left at the end of the first day, instead of starting a new duty. A list can also be conveniently completed before lunch the second day when only 15-20 minutes remain.

Another excellent time to complete a list is when committee members have shown some concern about some skills, knowledge, equipment, or behavior not receiving adequate attention. There is something magical about seeing the concern boldly described on the appropriate list. It allows the committee to move ahead with its remaining work.

As items for each list are suggested by committee members, they should be listed on flip chart paper and posted. Unlike the duties and tasks, the lists of knowledge, skills, tools, etc. do not need to be stated in action verb, object, and qualifier form. Usually it is easy to gain fairly quick agreement on the items for all four lists. For examples of the four lists, see each of the four sample DACUM research charts in Appendix A. When the flow of contributions slows noticeably, the lists should be considered adequately complete. If there is no pressure from the committee to recognize these items earlier in the process, development of these lists can follow completion of the task verification.

The **General Knowledge and Skills list** should consist of the major areas of knowledge needed by workers in that occupational field. It also should include skills such as decision making, problem solving, and interpersonal skills that underlie many of the tasks. All of the general knowledge and skills should be viewed as important enablers that make it possible for the workers to perform their tasks with precision and quality. Some facilitators prefer to separate the general knowledge items from the skill items.

Task F-9. Elicit List of Worker Behaviors

Worker behaviors (attitudes and traits) are important in every occupation. These behaviors, which vary widely from one occupation to another, should be identified by the committee without their looking at and "borrowing" ideas from other DACUM research charts. Similar to the general knowledge and skills, the worker behaviors serve as enablers which make it possible for the worker to react positively with other workers, supervisors, and customers. They support the successful performance of most tasks.

Task F-10. Elicit List of Tools, Equipment, Supplies, and Materials

It is very important to keep the tools and equipment listed separate from the actual job tasks if a high-quality job analysis is to be obtained.

When discussing tools and equipment, two words can be troublesome: **use** and **operate**. To use a wrench, a computer, or other piece of equipment is seldom an actual job task. Rather, it is a means or step in accomplishing a task. The same is true of operate. To operate a fax machine or a backhoe are not worthwhile tasks, but to transmit a fax or dig a trench are worthwhile. Tools and equipment lists will vary widely depending upon the type of job being analyzed. Care should be taken to avoid listing brand name tools and equipment.

Tools or equipment operation should be included as statements **only** when they reflect actual occupational tasks. The committee should be instructed to think about whether completion of an occupational task involves using a tool or whether the tool is used as a means to an end.

For example, a secretary is frequently responsible for assembling or collating printed materials, but rarely is responsible for operating a collating machine. Likewise, an auto mechanic may use several tools when performing the occupational task of "adjust a carburetor." The mechanic's use of a screwdriver and other wrenches in the process does **not** represent occupational tasks by themselves.

Task F-11. Elicit Lists of Future Trends/ Concerns

This list, which should be developed near the end of the workshop, is important in terms of giving the analysis an honest futuristic look. While it is unlikely that a DACUM committee can tell you what the new tasks will be in two to three years, they can readily identify with confidence what the future trends are, and what concerns, if any, they have about the future of the occupation. Care should be taken by the facilitator to see that the concerns discussion doesn't turn into a gripe session. Some facilitators prefer to separate the future trends list from the concerns items.

Task F-12. Identify List of Acronyms and Their Meanings

Most facilitators consider this to be an optional task activity that is conducted only when needed. Some jobs/occupations are laden with acronyms while others use few, if any. Whenever the committee starts to use a few acronyms, it is recommended that you ask the recorder to make note of them and their meanings. Keep adding to this list as other acronyms and abbreviations are used. Any acronym used on the DACUM chart should be defined.

Task F-13. Review Initial Brainstorming Lists

After completing the development of the four lists (five with acronyms), review the initial sheets of job brainstorming activities to determine if all items have been adequately addressed. Remember, these were the very first lists of work activities produced by the committee to describe their job, preceding the identification of the duties. The committee may already be satisfied that these items are covered. The facilitator **should not** insist that, as a result of the review, each item appear somewhere on the DACUM chart, but **should** make sure the thought or idea behind each item has been adequately represented.

As always, the committee will be the final judge; they alone know what they had in mind.

This review will almost always result in the identification of three to eight new tasks, and in additions to one or more of the four lists. On occasion, it may result in the identification of one or two new duties.

Task F-14. Refine Duty and Task Statements

The skill and understanding of the committee with regard to the DACUM process should improve greatly as the chart and associated lists develop, step by step. That committee expertise should now be applied to a review the work they have done. Duty and task statements need to be reviewed for adequate clarity and precision. Certain additions, deletions, or rearrangements may be made to improve the quality of the chart. If the facilitator has done a good job, the committee at this point will feel a strong sense of ownership and will do what is necessary to be proud of what they have accomplished.

This is the point in the DACUM chart development process where the facilitator assumes a somewhat different role, **from being totally non-directive to being a more directive, quality control-oriented facilitator**. The facilitator should now advocate needed changes in duty and task statements to improve the quality of the results. Don't misunderstand: The committee members are still the content experts and have the final say. The facilitator, however, is the expert with regard to task criteria and has an obligation to help produce a high quality chart. That means questioning statements that are not clear and, at this point in the process, suggesting alternative verbs, better qualifiers, etc.

This is the time to capitalize on your combined expertise by reviewing each statement and refining those that need improvement. However, no sequencing should be done at this time. The committee should be permitted only to add any new tasks found missing or to delete or reword tasks that overlap one another.

The facilitator normally begins by reviewing the tasks, duty by duty, in the same order as they were initially identified. The facilitator should **repeat** the statement as it is worded and ask the participants to:

- **Critique the action verb**. Is it the most accurate descriptor of what the worker actually does?

- **Review the object.** Does it represent the thing or person acted upon by the worker?

- **Check the modifiers, if any.** Are those used correct? Are others needed? Have unnecessary modifiers, such as "effectively" and "efficiently" been omitted?

Reviewing the chart at this stage should result in considerable clarification and numerous word changes. New cards should be written for statements that are changed in order to keep the appearance of the chart as neat as possible. When reviewing a group of tasks, the members should be able to quickly recall what was meant earlier when the task was added to the wall.

If there are questions or doubtful facial expressions in evidence when a statement is read, the committee must be encouraged to review and clarify it.

The facilitator must constantly challenge the committee to think of the most accurate and descriptive terms. It is important to insist on precision. For example, note the major differences between "select" and "prepare" instructional materials and between "critique" and "revise" written documents. (The facilitator may wish to remind the participants that their names will be associated with the published chart in order to encourage them to make the definitions as precise as possible.)

A few other points should be stressed. A task statement should contain as few words as possible (usually a maximum of eight) and still be completely descriptive. Often, three words are sufficient. Long statements tend to lack focus and do not lend themselves to chart presentation.

Although task statements may be moved from one duty area to another during refinement to obtain the best possible fit, **the same task should not appear twice**. Instead, the participants should decide on the best fit. If there are two similar but different tasks that the committee says are important, different wording should be used.

Each duty area should consist of at least six specific task statements. If the group can specify only two or three tasks, the duty area should be combined with another related area. On the other hand, if a particular duty area results in the identification of a large number of tasks (e.g., twenty to thirty), there may be justification for dividing that area into two duties.

Once the tasks in each duty area have been refined, you should ask the committee if the duty statement is still an accurate description of that general area of responsibility. Sometimes the scope of the duty statements should be narrowed or broadened to reflect the specific tasks more accurately. To the extent possible, each duty statement should be inclusive of all the tasks within the area and exclusive of all the tasks specified for the other duty areas.

Your responsibility is to stimulate the participants to make any needed refinements. You may question and challenge their statements and even propose alternative wording, but you must always allow the committee to make the content decisions.

Task F-15. Sequence Task Statements

Sequencing the task and duty statements does not take a lot of time, but good results add significantly to the quality and appearance of the final chart. It is important that eventual users be able to see the finished work in some type of organized structure. Work that is not systematically organized in some fashion tends to lack credibility and seems incomplete to the viewer who is searching for structure.

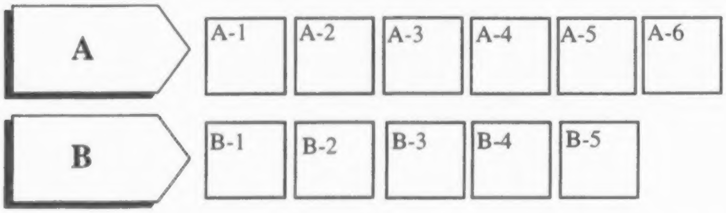
Before asking the committee to sequence the tasks within each duty, the facilitator should provide a sequencing rationale. Several ways of sequencing may be used:

a. the **most logical flow of work activity** or performance on the job
b. in **order of relative task importance**, from greatest to least
c. in **order of relative task difficulty**, from least to most difficult

Probably the best form of sequencing and the easiest for most panels is the first, the logical work flow arrangement. Most tasks, because they represent parts of an overall process, are performed in a natural, chronological flow and are very easy to sequence. Other tasks may involve activities that are more difficult to sequence because the order in which they are learned or performed is arbitrary. The participants should be advised to sequence such tasks arbitrarily. Sometimes they will discover two or more subsets of tasks in one category that logically follow one another.

The other two approaches, relative task importance and relative task difficulty, seem to work better in theory than in practice. First of all, the ranking of tasks based on importance and learning difficulty is best obtained through the verification process rather than from a tired and exhausted panel. Asking your committee to agree on the ranking of 75-125 tasks after completing the other analysis work is unfair and could result in strongly negative reactions.

Usually, the facilitator should select the first duty area to be sequenced. Based on his or her knowledge of what needs to be done, the facilitator can select an area in which some of the tasks are already sequenced according to the criteria or in which it appears that sequencing may be readily accomplished. As the task sequences are agreed to, the facilitator should physically rearrange the 5 x 8 cards on which the task statements are written.



During the task sequencing phase, the committee may discover a missing or overlapping task statement or some other needed revision. The facilitator must not permit **major** changes at this point, but some revisions should be allowed. Once a band of tasks has been sequenced, review it from beginning to end (left to right) and elicit final agreement before going on to the next duty area.

Task F-16. Sequence Duty Statements

Once the group has sequenced all of the task statements, the facilitator should ask the committee to study all the duty areas. The objective now is to organize the entire analysis as it will appear on the printed chart. Two factors should be considered at this point.

First, what duty area best represents and projects a positive image of the occupation? In analyzing the legal assistant occupation, for example, one group of participants felt that their work in "assisting clients" represented the most important aspect of their jobs. At the same time, the need to "coordinate office functions," even though a large number of tasks were involved, was considered least representative of their profession. Therefore, the committee requested that the "assisting clients" duty appear at the top of the chart and that "coordinate office functions" be placed at the bottom.

Second, which duties have similar tasks or logically follow one another? You should suggest the vertical shifting of one or more duties to keep related duties together. It should be noted, however, as with the task statements, that the top-to-bottom sequencing of the duty areas usually is partly an arbitrary one. Normally, any physical change in the sequence of duty areas is not made at this time; rather, it is noted by the marking the preferred order (A, B, C, etc.) on the duty statement sheets.

Task F-17. Assess Chart Using DACUM Quality Standards

This step should be viewed as an opportunity—perhaps during a brief break—to **personally** check to see if everything that should be done to meet DACUM Quality Standards has been done. See pages F-27 to F-30 in the Introduction for a copy of the DACUM Quality Performance Criteria. Check in particular those criteria pertaining to job tasks, task statements, and the four lists. Review these items while the committee is still available to make any needed changes.

Task F-18. Conduct Final Review of Chart

The facilitator should now be ready to obtain final agreement on whether the chart is a reasonably accurate and comprehensive description of the participants' occupation. Normally, the participants will quickly agree that the chart is complete and will want to know how soon they can obtain a copy to show their supervisor(s) and colleagues.

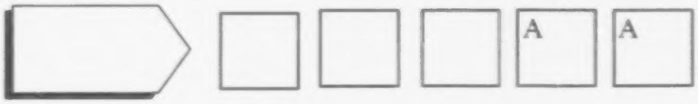
At this point some facilitators permit an instructor who has observed the entire analysis process to briefly address the committee **before** seeking final closure on the chart. The purpose is to give the instructor a last-minute opportunity to make positive remarks about the process and/or to question either the omission of a task believed important or the inclusion of a task not well understood. This opportunity provides motivation for instructors, who can gain technical skill updating from the sessions, to attend.

Usually only one or two items are questioned and the instructor is complimentary of the committee's work.

Identify the Entry-Level Tasks

Some institutions want the facilitator to ask the committee's help in identifying tasks that represent essential entry-level (i.e., beginning worker) tasks versus those that represent more advanced tasks that are usually learned on the job. When revising or establishing a vocational or technical education program, there is seldom enough time available to address all the occupational tasks that one may need. Some of the less important or less frequently used tasks may, therefore, legitimately be deferred and addressed later through on-the-job training or advanced courses.

To identify what may be called the essential entry-level tasks, the committee should review the task statements listed in each duty area. Using a colored marker, the facilitator should place an "A" or some other marking on those cards which the majority of the members feel represent advanced-level tasks. Normally, if the sequencing in the previous step is done well, this will take very little time, because the advanced-level tasks are likely to be located at the right end of each duty.



Another option, if desired (or if time does not permit completion of this step during the workshop), is to question expert workers and supervisors about entry-level tasks during the verification process, which commonly follows the workshop.

Conduct Other Options, As Desired

The choice of other activities at this stage will be influenced by the amount of time available before the promised dismissal time. In advance of the workshop, the facilitator should discuss with the appropriate DACUM institutional representative what options exist at this point and what their preferences are, given adequate time.

If there is time and interest, some of the following activities may be completed:

- Revise the occupational definition.
- Establish career ladder profiles.

Revise the occupational definition. If the host institution plans to make further use of the initial occupational definition used, then the participants should be asked to review it again and to suggest appropriate changes that better reflect the essence of the detailed definition on the wall (DACUM chart). A committee will frequently take the duty statements and combine them into descriptive phrases that provide a good general definition of the occupation.

You may also want to ask the participants if they have a recommendation regarding the best title for the chart. Would a group of legal paraprofessionals, for example, prefer "legal assistant" or "paralegal?" In some cases, the title may be obvious and the committee should not be asked to suggest a title just to be different or unique. The title should reflect the narrowness or the breadth of the occupational analysis. For example, an analysis that includes two or three related jobs should be given a more encompassing title than one that includes an analysis of a single job.

On occasion, DACUM analyses have been conducted to identify a portion of a person's job (e.g., the role of the vocational teacher when implementing competency-based education). In these instances, some type of qualifying statement should be developed and added to the chart so that readers will understand the nature of the analysis and not be misled.

Establish job profiles. When an analysis by design includes two or more related job titles, the committee may be asked to specify which tasks are common to all of the job titles and which are unique to one or more of them. For example, an analysis of the clerical occupations will frequently include both typists and secretaries. Specifying the tasks common to both and, in this case, those expected only of secretaries is useful for program development, as well as in student counseling. A simple coding system, such as 1 = common core, 2 = typist, and 3 = secretary, can be quickly applied to the task statements with the help of the DACUM committee. Some institutions later shade or color-code the task statements to reflect the various career ladders represented on a single profile chart.

Task F-19. Code Task and Duty Statements

Before anything is removed from the wall, the facilitator should supervise the numbering and lettering of the DACUM chart to ensure the preservation of its final structure. A simple but very workable procedure is to label each duty area from top to bottom with capital letters: A, B, C, and so forth. Then label each individual task in each duty area sequentially from left to right: A-1, A-2, A-3; B-1, B-2, B-3, and so on. Finally, the facilitator should remove each duty area and its associated tasks and stack them in proper sequence for later typing. The original work should be filed in a secure place at least until such time that a typed copy of the DACUM profile chart has been prepared and the copy has been carefully proofread.

The lists of general knowledge and skills, worker behaviors, future trends and concerns, and tools, equipment, supplies and materials developed during the DACUM analysis are usually recorded on flip chart paper. Preserve these lists, together with the cards representing the DACUM chart, for later transcription and inclusion as part of the DACUM analysis information.

Task F-20. Administer Committee Evaluation of Workshop

Most facilitators ask participants to evaluate the workshop activities and to offer comments regarding their reactions to the DACUM process. This type of process evaluation can help both the facilitator and the host institution in planning future workshops. Comments and evaluations are usually quite positive and provide useful data to share with concerned administrators and/or sponsors. A sample instrument for evaluation is presented on page F-31.

Once the committee's work is finished, you should sincerely thank the members for their cooperation and persistence. You should reemphasize the importance of the participants' contribution to the institution's training efforts. Letters of thanks and a copy of the published chart should be sent to each member of the committee soon after the workshop. Letters of thanks should also be sent to company contact persons and/or chief executive officers.

When the committee's work is finished, you should thank the members sincerely for their cooperation and persistence. You may reemphasize the importance of their contribution to the institution's training efforts. Tell them that they will receive a copy of the chart as soon as it is published. If all has gone well, it is common that this experience will contribute to development of a strong bond of cooperation among the committee members, their firms, and the host institution.

Depending on the situation, an institutional representative may indicate the school's desire for continued cooperation in one or more ways. Some committee members may volunteer to serve on an advisory committee, for example, or to work with the instructors and curriculum development specialists as technical content experts. Frequently, strong bonds of cooperation develop among the committee members, their firms, and the host institution which enhances it's ability to provide relevant services to its students as well as to the business community.

Task F-21. Arrange for Recognition and Publicity

Some institutions, wanting to express their gratitude to committee members for their time and energies, award certificates of appreciation to each member. An appropriate administrator or other representative of the institution should award these certificates.

Some facilitators arrange for photos to be taken during the workshop and a final group photo, perhaps in front of their completed DACUM chart. A copy of the group shot can be sent to each committee member along with the finished chart. Many companies, colleges, and agencies have a person who, upon request, is happy to take pictures.

Besides certificates, recognition of the contributions made by the experts may also take the form of token gifts such as coffee mugs, t-shirts, or caps. A small investment of this type will usually reinforce the committee's support of your efforts.

Positive public relations can not hurt and can potentially help a lot. Prepare or request that someone else prepare a news release or article about the workshop. The article can discuss the purpose and outcomes and can be accompanied by appropriate photos. Be sure that the names, positions, and affiliations of the expert workers are included. Articles can be submitted to appropriate newsletters, local newspapers, or internal or external company publications.

DACUM VERB LIST

APPLICATION

Address
Apply
Assign
Care for
Carry out
Deposit
Dispatch
Distribute
Effect
Employ
Implement
Issue
Obtain
Process
Specify

CREATIVITY

Budget
Change
Conceive
Conceptualize
Create
Design
Develop
Devise
Forecast
Formulate
Initiate
Modify
Originate
Revise
Simulate

MANAGEMENT

Administer
Approve
Arrange
Assign
Conduct
Contract
Control
Coordinate
Direct
Manage
Negotiate
Officiate
Organize
Oversee
Regulate
Review
Schedule
Supervise

COLLECTION OF INFORMATION/ THINGS

Collect
Detect
Convey
Count
File
Gather
Inventory
Locate
Obtain
Order
Procure
Requisition
Secure
Select
Sort

EVALUATION

Adapt
Appraise
Assess
Audit
Check
Compare
Evaluate
Identify
Inspect
Interview
Investigate
Judge
Measure
Observe
Measure
Monitor
Rate
Test

PROBLEM SOLVING

Analyze
Calculate
Decide
Determine
Diagnose
Estimate
Examine
Plan
Research
Solve
Study

COMMUNICATION

Advise
Confer
Consult
Contact
Convey
Disseminate
Inform
Interpret
Key-in
Motivate
Notify
Post
Present
Read
Recommend
Survey
Transcribe
Type

MAINTENANCE

Adjust
Align
Assemble
Clean
Install
Maintain
Manipulate
Modify
Lubricate
Paint
Preserve
Regulate
Remove
Repair
Replace
Rewire
Rotate
Service
Set up
Store
Straighten

PRODUCTION

Build
Complete
Compute
Construct
Demonstrate
Duplicate
Execute
Exhibit
Fabricate
Fasten
Grind
Layout
Load
Make
Perform
Practice
Rebuild
Solder
Weld

RELATIONSHIPS

Assist
Cooperate
Counsel
Follow
Help
Instruct
Lead
Participate
Orient
Teach
Train

VERIFICATION AND SUPPORT

Establish
Facilitate
Justify
Prove
Record
Support
Verify
Weigh

WRITING

Author
Compile
Compose
Correct
Draft
Draw
Edit
Illustrate
Outline
Prepare
Record
Revise
Write

Note: This is not an exhaustive list of all possible or acceptable task verbs. It does contain some of the verbs most commonly used by DACUM committees. Sometimes verbs are unique to the particular occupation and, therefore, should be used as long as they accurately describe **what** the worker is doing.

DACUM WORKSHOP EVALUATION

Name (optional) ______________________ Date: ______________

Job or Occupation ______________________________

The purpose of this evaluation is to provide feedback for the DACUM facilitator(s) to use in planning and conducting future workshops. Please complete the following checklist by marking the most appropriate response--Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD). Your comments on the last three questions would also be appreciated.

	SA	A	D	SD
1. Information given to you about the workshop prior to your arrival was sufficient.	☐	☐	☐	☐
2. The workshop moved in a smooth businesslike manner.	☐	☐	☐	☐
3. The DACUM facilitator(s) carried out their roles in a positive and effective manner.	☐	☐	☐	☐
4. The workshop was interesting and informative.	☐	☐	☐	☐
5. Sufficient time was allocated for completing all activities.	☐	☐	☐	☐
6. The workshop facilities were adequate.	☐	☐	☐	☐
7. The workshop location was suitable.	☐	☐	☐	☐
8. Arrangements for meals and breaks were sufficient.	☐	☐	☐	☐
9. My participation in this workshop was a worthwhile endeavor.	☐	☐	☐	☐
10. I would recommend participation in similar workshops to fellow workers.	☐	☐	☐	☐

11. The weaknesses of this workshop were:

12. The strengths of this workshop were:

13. My reaction(s) to DACUM as a process for identifying tasks and related information important to education and training is:

Duty G—Verify DACUM Results

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Task G-2. Develop Verification Strategy G-3

Task G-3. Develop Verification Instrument(s) G-5

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Resources:

Sample Letter, Task Verification Formats, and Rating Scales G-13
Validating Technical Program Curricula . . . G-19
Sample Cover Letter and Task Statement Write-ins Form G-21
Graphic Presentation of Data G-23

AFTER THE WORKSHOP

Verify DACUM Results

As a result of the DACUM workshop, the institution has an occupational analysis listing all of the tasks workers perform in that occupation. It also has comprehensive lists of the general knowledge and skills required, important worker behaviors, the tools, equipment, supplies and materials used, and future job trends/concerns. These lists were obtained from an unimpeachable source—expert workers and supervisors. Now you must present your data in an attractive, easy to read and understand form. It might at first appear that your company or agency is ready to prepare a DACUM Research Chart and have it laminated in plastic and declared an official document of the agency. However, this is not usually the case. The tentative list most likely should be subjected to verification by other experts.

Task G-1. Publish Draft of DACUM Research Chart

There is a lot of truth to the adages "first impressions are important" and "a picture is worth a thousand words." Such is certainly the case with a DACUM Research Chart. Before deciding on a final format, an institution should review the many types of formats available and then take the time to devise one that will work well for the intended use. See pocket of the back cover for several examples.

For easy reference, most institutions code each duty and task statement using a numbering and/or lettering system. These codes are then used to coordinate materials for a particular task such as learning guides, modules, media, performance checklists, and so forth.

One common way (used in this document) is to assign capital letters, in alphabetical order, to each duty area (e.g., A, B, C, D), and letters and numbers to each individual task in each duty area (e.g., A-1, A-2, A-3, B-1, B-2, B-3). The sample DACUM charts in the pocket of the back cover offer examples of this type of labeling.

A number of Canadian educational agencies employ a two-digit code for the duty areas (e.g., 01, 02, 03, 04) and use the same double-digit system for each of the individual tasks (e.g., 01-01, 01-02, 01-03, 02-01, 02-02, 02-03).

The physical layout and appearance of whatever format you adopt can do much to create a favorable impression on those who use the chart. And, since the DACUM chart lends itself to many uses, many influential people (besides teachers/trainers and students) are likely to see it. It is highly recommended that an institution decide what information should be on its DACUM profiles, and then employ a graphic artist to develop one or more designs for final approval. The selected format should then be used for all the institution's occupational programs.

Perhaps the biggest question in determining the chart format is, "What information beyond the duties, tasks, and four lists should be included?" There are several options. The following types of information are essential:

Front Cover

- Institution's name
- Committee members names, titles, & city/state
- Occupational title
- Facilitator's name(s) & affiliation
- Date of development
- Institutional logo

The following types of information are desirable:

- DACUM recorder's name
- Observer's Name(s)
- Rating scale
- Student and instructor name identification spaces

Some institutions prepare a special cover drawing to reflect each occupational area of concern. Others, such as Holland College, design their DACUM charts to serve also as a "Record of Achievement" and encase them in plastic.

Once the DACUM chart format is determined, the facilitator should supervise its production to ensure that a high-quality, accurate chart is produced. The actual mechanics of typing or composing the chart will vary considerably, depending on the equipment available. The typed chart must be carefully proofread, checked for accuracy against the list of tasks, and corrected neatly and expertly.

If photo reduction is used, do not reduce the print size too much to save space. Most institutions use either 11" x 17" cover stock or two or more sheets of 8 1/2" x 11" cover stock assembled in plastic. If the budget permits or institutional facilities are available, have the chart printed rather than duplicated. Do not accept anything short of the highest quality reproduction. And be sure to print an ample supply.

Task G-2. Develop Verification Strategy

The process of "verifying" the tasks confirms that the tasks listed are, in fact, the tasks that students/workers will need to be able to do when they enter or advance in the occupation locally. The tasks should be submitted to people currently active in the occupation for their critical examination. The verifiers should be asked to consider each item and determine whether or not that item is actually a part of the occupation. They may also suggest additional tasks that, in their opinion, appear to have been omitted.

There are a number of reasons **why** it is useful to verify a DACUM task list. For instance, the tasks students are required to achieve may be affected by local codes or regulations. There may be special practices, tools, or equipment used by the businesses or industries at which students become employed. Union agreements in the area may determine which craft does what tasks. These kinds of considerations can be clarified if the task list is scrutinized by people in the occupation who know local conditions, job requirements, and the latest occupational trends.

There are two schools of thought as to whether occupational analyses done by the DACUM approach need to be verified by another group. One group of facilitators (at Holland College) holds that further verification serves no useful purpose because the original DACUM committee itself was selected from specially qualified local or regional practitioners. They believe that subjecting the chart to review and possible change by others makes the work of the committee seem less important, increases costs, and adds little.

The other school of thought contends that there are inherent risks in adopting the DACUM results without further input. These facilitators believe that a DACUM committee is small and may not be representative of the entire occupation. In addition, the public relations value of having a larger number of qualified workers and supervisors review the analysis would be lost. They gain greater confidence that the tasks identified are, in fact, the really important ones by having other experts review it for completeness and accuracy. This is especially important if the results are to be used for state or national curriculum development or instructional purposes.

Many types of data, such as the **importance of the task**, and the **difficulty of learning it**, may be obtained readily through the verification process. Each institution has to consider the costs and benefits of verification and decide which approach will better serve its needs and wishes.

If the institution decides to conduct some type of verification, a strategy for carrying out the process needs to be devised. The degree of sophistication and type of verification process used can vary widely. Concerned faculty may wish to conduct a fairly comprehensive verification study for a new program for which there is little current information available.

For programs that are to be updated and for which considerable literature (i.e., other occupational analyses) exists, it may be most appropriate to have the program's occupational advisory committee review the DACUM competencies. To structure the verification process, the following questions must be addressed:

- Who will conduct the verification?

- What questions will be asked?
- What instruments will be used?
- What rating scales will be used?
- How will verifiers be identified and selected?
- How will the data be collected and analyzed?
- How will task statements be modified?

The DACUM facilitator (or other person) who conducts the verification survey should possess skills in developing questionnaires and processing the collected data. The facilitator is usually already experienced in making contacts with industry personnel and is therefore usually in a good position to identify persons qualified to serve as verifiers.

In all likelihood, three other parties will also need to become involved in verification activities: (1) an administrator who can give the necessary approvals, (2) the curriculum specialists and instructors, and (3) advisory committee members. As with the identification of DACUM committee members, the latter two groups often are able to assist with the identification and selection of verifiers.

Task G-3. Develop Verification Instrument(s)

When preparing a survey or task inventory instrument, the facilitator or person in charge needs to consider carefully what type of information is needed. Keeping the number of questions to a minimum ensures a better rate of response. Gather only information that is relevant to the institution as it proceeds to organize and develop a responsive curriculum based on the DACUM analysis. Questions should include the following:

- **Importance of the task**. How important is the performance of this task in your job as a __________?

- **Learning difficulty**. How difficult is it to learn to perform this task?
- **Entry level**. Is this task expected of a beginning worker?
- **Criticality**. How critical is the performance of this task?
- **Frequency of performance**. How often do you perform this task?

You may also want to ask respondents to react to the four lists gathered in the DACUM workshop. Provide space so that the verifiers may add additional items that they believe to be important.

It is important to be reasonable. Rather than asking a lot of questions just to gather information, know in advance exactly why the information is needed and what will be done with it. Two questions about it each task statement are probably best, and certainly no more than three questions. It is a good idea to develop a quality verification instrument and, if possible, pilot-test it with two or three sample respondents to make certain the directions are clear. The format of the instrument should be attractive and the reproduction quality high. See pages G-13 to G-17 for ideas on sample formats, rating scales, and cover letters.

Task G-4. Select Verification Respondents

Verifiers should consist of a group of expert workers in the occupation and/or the immediate supervisors of workers who have direct responsibility for getting the work done. Again, no high-level administrators, personnel managers, or theoreticians should be used. The criteria for selection of the verifiers are essentially the same as those for identifying the DACUM participants. The verifiers should be persons who can accurately be labelled as experts. Unlike the participants, however, the verifiers do not have to verbalize the skills.

Some coordinators make a serious mistake in the selection of the verifiers by (1) mailing the questionnaire to all the known practitioners in the region, or (2) using a table of random numbers to select a random sample of manageable size (25-50 persons) for the purpose. The **serious weakness** of these two options is that some of the opinions received will be those of individuals who are only minimally qualified. Mixing data from the experts with data from those less qualified may result in substandard data for program development.

The verification process should be a local one, but the term "local" may need some definition. If an institution training textile equipment maintenance workers places all its students in the three mills in town, then the related task list should be verified by workers from the immediate area. If an agricultural training program prepares workers for tropical foliage nurseries located in two counties in the central part of the state, those counties become the area for "local" verification. If a school has the only laser/optics program in the state and graduates are employed over a wide geographic region, a related task list can be verified by expert workers across the state and in several nearby states.

Selecting a verification group need not be a major effort. A program's occupational advisory committee may be satisfactory for the job if it is composed of the right kind of people. Such experts should be involved in every step of planning for competency-based education, and DACUM chart verification is a crucial task in which they ought to be involved. If they do not participate directly in the verification, they should at least be asked to help identify firms, employees, and first-line supervisors who are qualified to be verifiers.

Another important group who can help identify qualified respondents is the DACUM committee itself. During the workshop ask each member to give you the names and addresses of qualified persons.

Task G-5. Collect Verification Data

By Committee. One approach used to collect the data needed is to convene a special verification committee, for the sole purpose of reviewing the task statements. Select committee members (10-15 is a workable group) on the basis of recommendations from knowledgeable people in the occupation. A two-hour meeting of the committee should be sufficient for reviewing the tentative task list and obtaining any desired task ratings. This method can be expensive if it involves travel and per diem expenses.

The facilitator should structure the job of reviewing the list one area of competence at a time. Examine each task statement individually, and move the committee's attention along if there are no questions or problems. If the original task list is thoroughly developed, there should be relatively little that requires significant change, but the recommendations made by the verifiers should be addressed, and appropriate revisions made.

By Mailed Questionnaire. This is probably the most efficient and most frequently used data collection procedure. Send a well-developed questionnaire along with an appropriate cover letter to 25 workers and 25 supervisors. Respondents may complete the questionnaire when it is most convenient to them, without missing any work.

It is important to contact and remind those not responding by follow-up letter or telephone call. This approach costs far less than convening the committee. Costs include the printing of the instrument, postage, telephone charges, and secretarial services.

Interview/observation. If verification is done through interview/observation techniques, the facilitator must prepare interviewers, write introductions to employers, and arrange sufficient free staff time to conduct the interviews. This approach is probably too costly for most institutions to seriously consider.

See pages G-19 to G-20 for a description of how one community college validates technical program curricula.

Task G-6. Analyze Verification Data

Once the task data have been collected, they must be tabulated and organized into a usable format. The first step in this process is to check the forms for completeness. Those that are not properly completed should be discarded and not considered any further.

Tabulate the data by counting the responses to each statement (referred to as frequency counts). For hand tabulating, you can use (1) a blank form similar to the one used during the data collection if you have a fairly low number of respondents or (2) a specially prepared form that will accommodate the tallying of a large number of responses in each category. The form should be arranged so that the results are clear and the information is usable.

If you have a particularly large quantity of data, you may wish to use data processing equipment. Such equipment can streamline your handling of data, which is a decided advantage if your respondent group is large. Again, you will need to plan the format in which you wish the results to appear. By working carefully with a data processor, you can determine what format is both possible and most useful.

If additional statements were added by respondents during the verification process, the best way of handling these statements is usually to tally them in a separate section of the summary tabulation form. The number of individuals adding any one statement is likely to be low.

Once the frequency counts have been tallied, the data should be analyzed and put into a form that makes them easier to interpret. This can be done using tables, bar or line graphs, or frequency scores. Perhaps the easiest way, however, is to convert the data into percentages or averages. Data can be presented as percentages for each statement, both numbers and percentages of responses for each statement, or mean (average) responses.

Importance									
Task Statement No.	Extremely Important (3)		Of Moderate Importance (2)		Of Little Importance (1)		Not Important (0)		AVERAGE
	No.	%	No.	%	No.	%	No.	%	
1	5	17	17	57	0	0	8	27	1.6

To arrive at the average or mean for the responses, a value must be assigned for each scale category. Note in the sample that extremely important was assigned the value of 3; of moderate importance, 2; of little importance, 1; and not important, 0. The assigned value for a specific category is first multiplied by the number of individuals who responded to that category. Next, the totals for the columns—four in this case—are added together. The sum resulting from this operation is then divided by the total number of respondents, which results in an average.

For example, to obtain the average indicated in the illustration of importance, the following was computed:

Number		Value		Totals
5	x	3	=	15
17	x	2	=	34
0	x	1	=	0
8	x	0	=	0
30				49

The total obtained, 49, was then divided by the total respondents, 30. As a result of this division, the average of 1.6 was obtained.

Whatever format you use, select it with an eye to the steps you will perform next, which are to select tasks for training and to compile a final task list that reflects the selections. Be sure that the format is conducive to making these decisions.

Task G-7. Refine DACUM Chart Based on Verification Data

Once the data have been summarized, they should be carefully interpreted to see what changes are needed in the tentative task listing. Sometimes respondents will point out one or two tasks that somehow were missed by the DACUM committee. Comments made by several reviewers may also suggest that a few statements need some modification to clarify their meaning. Changes of this nature require that the program developers or instructors make good professional judgments.

One way to deal with write-in tasks statements is for the project team to carefully study them to see if they are really tasks that meet the accepted criteria and that they are not already addressed with slightly different words by the existing tasks. The team can make a collective judgment about whether to add a statement or not.

Other methods involve getting input from the committee. A simple method is to phone two or three members of the DACUM committee to obtain their reactions. Perhaps the best approach is to develop a cover letter and one-or two-page questionnaire (see pages G-21 and G-22) listing the write-ins and some tasks notes prepared by the facilitator. Send or fax the questionnaire, a cover letter, and copy of the draft DACUM chart to all committee members for their quick response. Summarize these responses and accept the vote of the majority.

In a school or college setting, the program advisory committee may also be consulted regarding proposed changes.

Task G-8. Publish Verification Report

The verification report should attractively and accurately present all of the verification findings in easy to read and understand form. The data should include for each task of each duty:

- Mean responses in the same order as the questionnaire
- Mean responses on each question (e.g., importance and learning difficulty) in descending order within each duty.
- Percentages and frequency tallies are an acceptable alternative

Other data that should be presented includes:

- List of any task statement write-ins and their disposition
- Additions to the four lists
- Demographic data that describes the respondents

You should also include:

- Copy of revised DACUM chart
- Copy of verification instrument
- Copy of cover and follow-up letters

The presentation of this data in graphic and colorful form can greatly enhance its readability. Some of today's software programs readily lend themselves to the production of appealing reports. See pages G-23 and G-24 for two samples of the graphic presentation of verification findings.

T·H·E
OHIO
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UNIVERSITY

CENTER ON EDUCATION
AND TRAINING FOR EMPLOYMENT

1900 Kenny Road
Columbus, Ohio 43210-1090

Phone: 614-292-4353
Telex: 9102505950
Fax: 614-292-1260

We are committed to develop individualized competency-based instructional packages that will help present and future administrators achieve greater competence through effective training. Before we can develop such materials, we must have the help of expert practitioners in identifying the competencies which really make a difference, and for which training is most important.

At our request, your state director of vocational education has nominated you as an administrator who is well-qualified to assist us with an important research task. By nominating you, in accordance with our selection criteria, he has identified you as one of the most capable local administrators of vocational education in your area. We hope you will find time in your busy schedule to give us the type of information that only a person in your position can provide.

Won't you please take the time now or in the next five working days to complete the enclosed "Administrator Task Inventory"? Your responses to the inventory will contribute significantly to our research efforts, and more importantly, help establish a better basis upon which future training materials and programs for local administrators can be developed. We have enclosed an Ohio State University pen for your convenience in responding to the inventory.

Your professional assistance in this important endeavor will be very much appreciated and if I can ever be of assistance to you, I hope you will feel free to contact me.

Sincerely,

Robert E. Norton
Project Director

REN/dw

Enclosure

ENVIRONMENTAL TECHNICIAN TASK VERIFICATION

Why We Need Your Help

We are conducting a regional study to determine the competencies needed by "Environmental Technicians" to effectively carry out their duties and tasks. You have been carefully selected as a qualified respondent, and your input will contribute significantly to the usefulness of this study and to the knowledge of the changing role of Environmental Technician. Because of the small and selective sample being used, it is very important that we have a response from everyone. Our goal is a 100 percent response which we believe is achievable because of the commitment to the process by professional technicians.

What Should You Do?

The Environmental Technician's position has been initially defined by a committee of ten experts representing business and industry, and educational agencies. This study requires the careful review and verification of the many tasks (initially identified by the DACUM Committee) that are believed to be performed by Environmental Technicians. You are also asked to identify and write in at the end of each duty any additional tasks you believe to be important. The knowledge and experience you have gained by your direct involvement in most, if not all, of these tasks make you uniquely qualified to advise us on both the **importance** of each task and on the degree of **task learning difficulty** that exists. Your individual responses will be held in strict confidence, as only group responses will be reported.

What Are the Expected Outcomes?

Once all of the important tasks have been identified and rated, the Department of Geological Sciences at The Ohio State University and the Center on Education and Training for Employment (CETE), as well as many others, can use them as a basis for (1) assessing technician training needs, (2) planning Environmental Technician training programs, and (3) identifying existing materials or developing new competency-based materials designed specifically to meet the training needs of Environmental Technicians.

Please try to complete this inventory within five working days. A stamped, self-addressed envelope is provided for your convenience in returning the inventory. After completing the inventory, please place it in the envelope that has been provided and return it to:

Dr. Robert E. Norton
Senior Research and Development Specialist
Center on Education and Training for Employment
College of Education
The Ohio State University
1900 Kenny Road
Columbus, OH 43210

PART 1 - TASK STATEMENTS

Instructions: **Please read very carefully!**

On the pages that follow, you will find a list of task statements clustered into ten major duties (A through J) that relate to the job of Environmental Technician. We need your personal reaction to two major questions about each task statement.

a. How **important** is the performance of the task **in your job** as an Environmental Technician?
b. How **difficult** it is to **learn** to perform the task effectively?

Answer these questions by completing the following steps:

1. For each task in Duty A, indicate how important you believe performance of the task to be. In the "Importance of Task" column, choose and circle the number that most accurately reflects the importance of that task **in your job** as an Environmental Technician. If you do not perform some of the tasks because they are **another person**'s responsibility in your agency, please circle the number that indicates how important you believe those tasks are to the overall success of an Environmental Technician in your agency. If a secretary or other non-technician independently performs some of the tasks listed, mark them as of no importance to your job as an Environmental Technician. Use the scale below to rate the importance of each task:

   5 = Of **Great** importance — Performance is critical to success of an Environmental Technician.
   4
   3
   2
   1
   0 = Of **No** importance — Performance makes no contribution to the Environmental Technician's success or is not performed by an Environmental Technician in your agency.

2. **Add** and rate the importance of any statements to Duty A that describe any other critical tasks that you have performed or that you feel need to be performed by Environmental Technicians. If you feel that any of the listed statements are incorrect or need clarification, please modify or rewrite them.

3. For each of the statements in Duty A that you rated to be of some importance (i.e., 1-5), indicate the degree of task learning difficulty. In the "Task Learning Difficulty" column, indicate the extent to which the task is difficult to learn to perform for most Environmental Technicians. Assume the person has the type of education and previous experiences that are typical for someone with a job as an Environmental Technician. Use the scale below to indicate the degree of learning difficulty:

   5 = Extremely Difficult — The task is extremely difficulty to learn to perform.
   4
   3
   2
   1
   0 = Extremely Easy — The task is extremely easy to learn to perform; no training is needed.

4. Repeat Steps 1-3 for each of the remaining duty areas.

5. Check the inventory to be sure that you have responded to **both** questions for **each** statement (except for those tasks you judged to be of no importance). Also, be sure to rate any task statements you have added or modified.

ENVIRONMENTAL TECHNICIAN TASK VERIFICATION

Note: Please be sure you have read the preceding instructions carefully before proceeding.

Importance of Task

How **important** is the performance of this task in **your** job as an Environmental Technician? (Circle **one** response)

Task Learning Difficulty

How **difficult** do most Environmental Technicians find it is to learn to perform this task effectively? (Circle **one** response)

	Task Statements	Great Importance			No Importance			Extremely Difficult			Extremely Easy		
Duty A:	**ASSIST IN PLANNING FIELD OPERATIONS**												
1.	Assist in developing scope of work	5	4	3	2	1	0	5	4	3	2	1	0
2.	Gather site-specific information (e.g., maps, potential problems, previous investigations)	5	4	3	2	1	0	5	4	3	2	1	0
3.	Review regulatory requirements	5	4	3	2	1	0	5	4	3	2	1	0
4.	Assist in developing health and safety plan	5	4	3	2	1	0	5	4	3	2	1	0
5.	Schedule field activities (e.g., time, personnel, equipment)	5	4	3	2	1	0	5	4	3	2	1	0
6.	Identify potential subcontractors	5	4	3	2	1	0	5	4	3	2	1	0
7.	Identify site access requirements	5	4	3	2	1	0	5	4	3	2	1	0
8.	Determine instrument and equipment needs	5	4	3	2	1	0	5	4	3	2	1	0
9.	Assist with the development of cost estimate	5	4	3	2	1	0	5	4	3	2	1	0
10.	Develop project specifications	5	4	3	2	1	0	5	4	3	2	1	0
11.	____________________	5	4	3	2	1	0	5	4	3	2	1	0
12.	____________________	5	4	3	2	1	0	5	4	3	2	1	0
Duty B:	**PREPARE FOR FIELD ACTIVITY**												
1.	Review scope of work	5	4	3	2	1	0	5	4	3	2	1	0
2.	Review health and safety plan	5	4	3	2	1	0	5	4	3	2	1	0
3.	Obtain personnel clearances	5	4	3	2	1	0	5	4	3	2	1	0
4.	Obtain utility clearance(s)	5	4	3	2	1	0	5	4	3	2	1	0
5.	Obtain equipment, supplies and instruments	5	4	3	2	1	0	5	4	3	2	1	0
6.	Identify site point of contact	5	4	3	2	1	0	5	4	3	2	1	0
7.	Obtain site access	5	4	3	2	1	0	5	4	3	2	1	0
8.	Check equipment operation	5	4	3	2	1	0	5	4	3	2	1	0
9.	Calibrate instruments and equipment	5	4	3	2	1	0	5	4	3	2	1	0

G-18

PART II

Instructions: Read each item carefully and write, or check where appropriate, your responses in the blanks provided.

1. Indicate your present job title: ____________________

2. Indicate your school, company, or agency name: ____________________

3. Did you receive formal Environmental Technician training? Yes _____ No _____ If yes, please indicate where: ____________________
____________________ and when ____________________

4. Please provide the following information to help us complete the Environmental Technician Occupational Analysis Profile:

   a. General Knowledge and Skills Needed

   b. Important Worker Behaviors

   c. Tools, Equipment, Supplies, and Materials Needed

   d. Future Trends/Concerns of Occupation

5. Other comments/suggestions

Thank you very much for completing this task verification.
Robert E. Norton

May 1994

the
DACUM
connection

VALIDATING TECHNICAL PROGRAM CURRICULA

MAINTAINING CURRICULAR CURRENCY is an ongoing challenge for technical programs. Technology programs need to be externally validated (verified) on a regular basis to ensure that student outcomes or competencies overall and for each course continue to match the needs of industry.

Columbus State Community College has developed an effective and relatively quick process for externally validating technical program curricula utilizing industry expertise. The process can also be used to develop new programs.

The underlying philosophy is that program validation is a continual process that requires commitment and must include both those persons responsible for and affected by the program. If possible, department faculty members are actively involved in all five steps of the process. The steps are as follows.

1. Select a validation committee. Appoint a program advisory committee or ask a currently appointed committee to become involved in validation. The committee should be made up of industry representatives and should meet monthly.

2. Prepare a program validation survey. Collect information to send to industry reviewers. One way Columbus State collects this important information is through DACUM job-analysis workshops. These workshops are conducted to identify the important duties and tasks that need to be addressed by each program. The resulting analyses include identifying the occupational and related outcomes for each program (written in competency-based language).

3. Conduct a representative industry survey. Columbus State's Engineering Technologies Division, for example, hand delivers to each respondent a survey packet that includes a cover letter signed by all full-time department faculty and a general questionnaire about their company's hiring expectations and future needs. During a brief interview, a faculty member informs each company's representative of the project's significance and schedules an appointment to pick up the survey two weeks later. After the surveys have been picked up, faculty members discuss the program in detail with respondents to collect as much additional pertinent information as possible.

Other ways to carry out this step are to mail the validation survey to industry representatives or to invite industry representatives to meet on campus to review the appropriateness of program outcomes.

4. Collect additional information. One method for completing this step is to conduct a DACUM—if one has not already been done—to collect needed information to better define the skills needed by workers in the occupation under review.

Others means of completing this step are to invite an external accreditation group to evaluate program operations and provide feedback or to visit similar programs at other institutions.

5. Modify existing curriculum. All faculty and department chairpersons need to block out a period of time—with no interruptions—to spend reviewing and discussing the recommended changes and deciding how to implement them. (Some departments do this by setting a retreat.) Results are then shared with the program advisory committee. Sometimes only minor modifications are needed. At other times, content requires total rethinking—how it

(continued)

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should be taught, what students should be able to do at the end of the program, and how student performance should be assessed.

Collectively, the DACUM research chart or competency profile, the industry survey, and the advisory committee review provide valuable input for curriculum validation and improvement. The program validation process needs to be repeated every three years in order to continually identify areas needing improvement.

Columbus State has seen many benefits from the validation process, including:

- assurance that all program and course outcomes are written in competency-based language,
- improvements in teamwork and morale among faculty because they are an integral part of the validation process,
- increased visibility and credibility for Columbus State programs within applicable industries, and
- identification of potential recruiters and program promoters.

For more information about the technical program curriculum validating process at Columbus State Community College, contact *Sheri Bidwell, Academic Affairs, CSCC,550 East Spring Street, Columbus, OH 43215; (614) 227-5012.*

CETE ANNOUNCES DACUM CERTIFICATION

The Center on Education and Training for Employment now offers two levels of DACUM certification (beyond the end of DACUM Institute Certification), which are available to individuals meeting the criteria described below.

Level I: **Certified DACUM Facilitator**

1. Conduct a minimum of three regular two-day DACUM-type job analysis workshops.
2. Submit a copy of the DACUM chart from each workshop to CETE for a written review and critique by two qualified staff or consultants. (Task and duty statements must meet CETE-specified [DACUM Handbook] standards.)
3. Submit along with the first chart
    - a letter of intent to obtain Facilitator certification
    - information about DACUM training received
    - a check or purchase order for $300.

Level II: **Certified DACUM Facilitator Trainer**

1. Obtain certification as a DACUM Facilitator.
2. Conduct a minimum of five additional DACUM job analysis workshops.
3. Submit a copy of each DACUM chart produced to CETE for review. (Charts must meet established DACUM standards.)
4. Submit along with the first chart for review
    - a letter of intent to obtain Facilitator Trainer certification
    - a check or purchase order for $750.
5. Submit a written critique of three DACUM charts that are sent to the candidate by CETE.
6. Submit a 1-2 hour workshop videotape (1/2" VHS) that includes both an orientation and a task identification sequence (minimum 30 minutes). (The chart from the videotaped workshop must be among those submitted for critique.)

Persons whose submissions meet specified criteria and who pay the required fee will be issued a frameable certificate specifying completion of a performance-based certification procedure.

For more information about DACUM certification, contact *Robert E. Norton, Senior Research and Development Specialist, CETE/OSU, 1900 Kenny Rd., Columbus, OH 43210; (800) 848-4815 or (614) 292-4353; fax (614) 292-1260.*

T·H·E
OHIO
STATE
UNIVERSITY

SAMPLE TASK WRITE-IN'S
COVER LETTER

CENTER ON EDUCATION
AND TRAINING FOR EMPLOYMENT

1900 Kenny Road
Columbus, Ohio 43210-1090

Phone: 614-292-4353
Telex: 9102505950
Fax: 614-292-1260

March 15,

Janie Thomas
Mountview College
4849 W. Illinois Ave.
Dallas, TX 75211

Dear Janie:

The revision of our **DACUM Handbook** is now seriously underway. I am using the draft DACUM Facilitator profile (see enclosure) that you helped develop as the basis for selecting content to be included in the revised handbook.

As you may recall, we submitted the DACUM workshop results to 70 experienced facilitators for verification purposes (draft report enclosed). Please see the report for ratings of task importance and task learning difficulty.

The verification also brought an unexpectedly high number of proposed additional (write-in) task statements. Refer to the enclosed list for specific suggestions along with some hopefully helpful comments on each. Rather than my making a singular judgment about the merit of these, I am requesting that you and the other original DACUM panel members react to the suggestions on the enclosed form. I will then summarize the results and prepare a final and verified copy of the new DACUM Facilitator's DACUM Research Chart. A copy will be sent to you.

Since there are only six of you (I am including John Hart), I need each of you to respond quickly. To respond should take you not more than 15-20 minutes. Please fax back to me at (614) 292-1260. Call me at (800) 848-4815, Ext. 4-7667 if you have any questions. Thank you.

Sincerely,

Robert E. Norton
DACUM Program Director

REN/dw

TASK STATEMENTS (Write-Ins) FORM

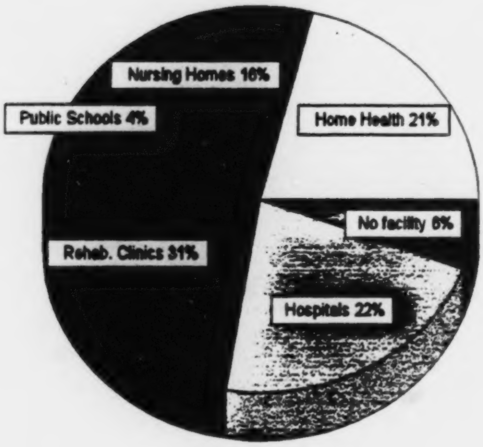
	Writer Task Notes	Task Should be Added/Deleted
Duty A Follow-up with customers Negotiate contract with customers	 See A-5 Add as A-7	
Continually assess place of Tech/DACUM Present DACUM overview to Dept/Redesign Team	See A-6 See A-1	
Duty B Select Competent Recorder Review Project Criteria w/DACUM Team	 Part of B-9 See B-3	
Customize DACUM activities to situations Maintain integrity of DACUM process	See B-3, B-6 Behavior	
Monitor logistics arrangements Finalize logistics arrangements	Add as B-13 Step of monitor?	
Duty C Review existing documents Identify alternate committee members Establish Dept/Functional Area reps	 See B-1 See C-2, C-9 See C-6	
Duty D Resolve committee concerns	 See E-3	
Duty E Evaluate progress of session Conduct process checks	 See E-2 See E-2	
Gather committee feedback for process Reinforce facilitator's role	See F-20 See D-8, E-7	
Reinforce committee member roles Clarify group tasks	See D-8, E-7 See E-4	
Duty F Explain follow-up to committee Resolve committee concerns	 Add as F-21 See E-3	
Duty G Publish Verification Report	 Add as G-9	
Duty H Obtain clearance of DACUM data Identify customer needs beyond DACUM	 Step in H-1 Add as H-6	

COMMENTS: The task notes are the suggestions of the researcher for your consideration **only**.

Submitted by ______________________________ ________________
Name Date

Physical Therapist Assistant

Survey Response by Facility



142 surveys were returned by professionals in the following North Carolina health care facilities:

Home Health	30
Public Schools	6
Nursing Homes	23
Rehab. Clinics	44
Hospitals	31
No facility listed	8
TOTAL	142

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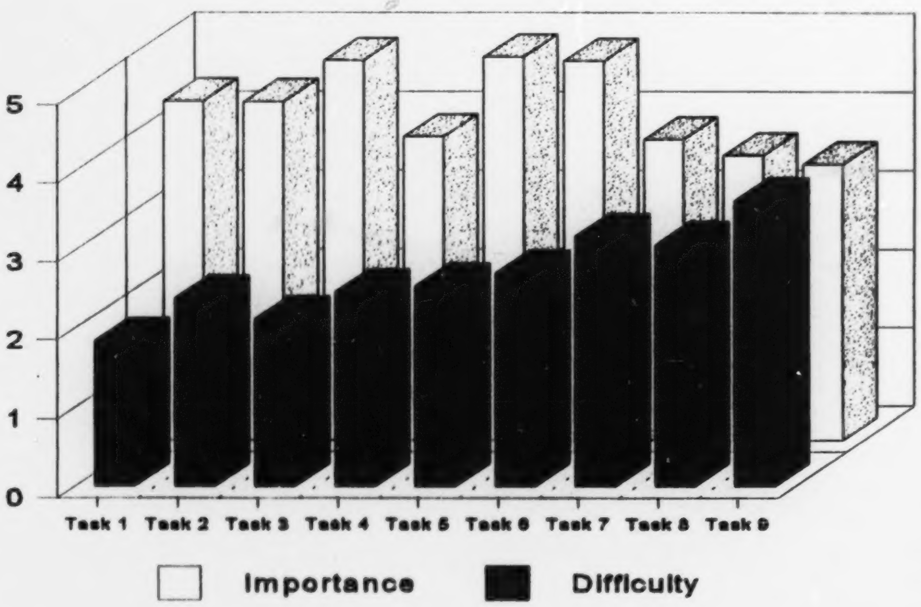
Taken with permission from "Statewide Competency Profile and Task Verification Report: Physical Therapist Assistant," by Stanley Community College, Albemarle, NC, May 1995.

Physical Therapist Assistant
Task Verification Results

Duty E: ADMINISTER DIRECT CLIENT/PATIENT CARE

Task Statements:

1. Prepare treatment area
2. Check current status (VS's, meds, etc.)
3. Inform physical therapist regarding changes in status
4. Check compliance of home safety assessment developed by P.T.
5. Use proper body mechanics
6. Implement therapeutic exercise programs (ROM, strengthening, flexibility)
7. Perform agility, strength, and endurance testing
8. Apply manual or mechanical traction
9. Perform joint mobilization techniques



NOTE:
Task verification results reflect a comparative analysis of the "importance of the task" and the "task learning difficulty" sorted by order of duty and task as represented in the DACUM chart (See Appendix A). An average rating for each section was obtained using a 1-5 scale with feedback from 142 currently practicing Physical Therapist Assistants in North Carolina.

Duty H—Coordinate Post-DACUM Activities

Task H-1. Publish Revised DACUM Chart . . H-1

Task H-2. Maintain Original DACUM Data H-3

Task H-3. Distribute the Revised DACUM Chart H-3

Task H-4. Acknowledge Contributors to the DACUM Process H-5

Task H-5. Consult on the Application of DACUM Results H-6

Task H-6. Identify Customer Need for Assistance Beyond DACUM H-8

Resources:

Task Analysis Forms H-9
DACUM Facilitator Certification H-13
DACUM Invitational Seminar H-15

Even after the verification process, there are several important tasks still to be accomplished. If you effectively carry out these tasks, you will be able to maximize the positive effect that the DACUM process can have on the educational institution, industry or business, or local, state, or federal government agency. You can help to really modify and develop programs that focus on the real needs of the learners, regardless of their age or setting.

Task H-1. Publish Revised DACUM Chart

In Task G-7, you carefully refined the draft DACUM chart based on the results of the verification data. Several options are open at this point, depending on your data:

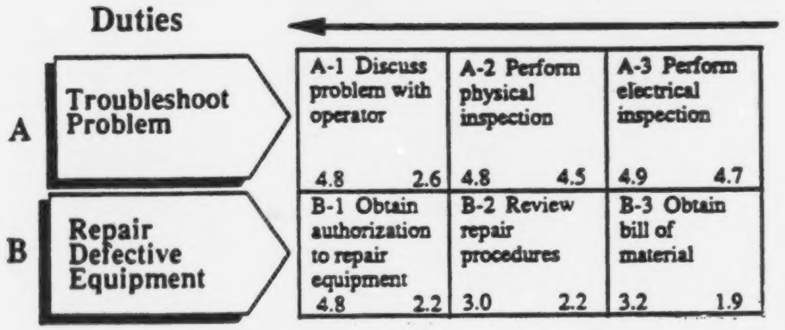
a. You may need to modify the wording of some task statements based on reviewers' comments.

b. You may need to add some of the "write-in" task statements. Be careful here that all write-ins meet the task statement criteria and that they are not already addressed by existing statements in slightly different words.

c. You may want to omit some statements that received scores below a previously established cut-off score.

d. You may want to add the task verification mean ratings for task importance and task learning difficulty or other factors to the space below the task statement in each box as illustrated. This presentation of key data about each task has been used extensively by some agencies.

DACUM Research Chart for **Electrician**



	Duties			
A	Troubleshoot Problem	A-1 Discuss problem with operator 4.8 2.6	A-2 Perform physical inspection 4.8 4.5	A-3 Perform electrical inspection 4.9 4.7
B	Repair Defective Equipment	B-1 Obtain authorization to repair equipment 4.8 2.2	B-2 Review repair procedures 3.0 2.2	B-3 Obtain bill of material 3.2 1.9

Note: Represents partial chart only for illustration purposes. Data presented is not actual. First number represents the mean for task importance, and the second the mean for task learning difficulty on a 0-5 scale.

Presenting your task verification data this way considerably reduces the need for a separate verification report. At the same time, a separate verification report allows you the opportunity to present more of the details that many developers and program administrators will want.

Once all of the changes have been made, and the document has been carefully proofread to make sure all desired information has been included (See Task G-1 for a recommended list), you will be ready to publish. Two questions now remain: Do we publish internally or externally? and How many copies do we need?

Several factors can help determine the answer to the first: agency policy, your funding level, your time parameters, the quality of production needed, and the cost of one source versus another.

To determine the number of copies, think about how the chart will be used with staff, advisory committees (if appropriate), student/trainee recruitment, as a public relations piece with local industry, etc. Most institutions begin with a run of 100-200, until their long-term needs can be determined.

Task H-2. Maintain Original DACUM Data

Policy and practice with regard to maintaining the original DACUM data varies widely. The recommendation is to maintain the original duty and task statement cards, plus the organizational chart and flip chart sheets containing the four lists for about three months. Keep this data for about one month after the DACUM chart has been drafted and submitted to the sponsor for review and approval. It is not uncommon to go back to the original data to check a task or other item. Once final copies have been reproduced and distributed, it is felt that the original data has served its purpose.

When DACUM Institutes or workshops are conducted at the sponsor's location, make and keep a handwritten or typewritten copy of the data for your own files and leave the original data with the sponsor. The original data can then be used by the sponsor to verify the accuracy and completeness of the draft chart. The facilitator should have the sponsor fax or send the draft chart to him or her for proofing.

Some companies and government agencies have more demanding documentation requirements. Before discarding any material, it is advisable to ask about the policy of the sponsoring agency.

Task H-3. Distribute the Revised DACUM Chart

One of a DACUM facilitator's most enjoyable activities is distributing the final product—the printed DACUM profile charts. The distribution list should include, but not necessarily be limited to, the following groups.

For Educators

a. Administrators—Deans, Department heads, Principals, Superintendent
b. Concerned instructors
c. Guidance Committee Members
d. Advisory Committee Members
e. DACUM Committee Members and their Supervisors
f. Board of Education/Board of Trustees Members
g. Enrolled and potential students
h. Curriculum development specialists

For Business Trainers

a. Managers
b. Department Supervisors
c. DACUM Panel Members
d. Trainers/Curriculum Developers

Distribute the charts as quickly as possible. Add a cover letter to let recipients know what is planned next, to assure them that maximum and effective use will be made of the DACUM and verification results.

You should also consider sharing your final DACUM charts with one or more of the following:

DACUM Research Chart Bank
Center on Education and Training for Employment
College of Education
The Ohio State University
1900 Kenny Road
Columbus, OH 43210-1090
Phone: 800-848-4815
Fax: 614-292-1260

This DACUM Research Chart Bank distributes high quality charts which have been produced during Center-conducted DACUM Institutes and workshops or in workshops conducted by Center-trained facilitators. Their availability is not intended in any way to replace conducting DACUMs locally. Charts on file are less than eight years old.

DACUM Exchange
Humber College of Applied Arts and Technology
205 Humber College Blvd.
Toronto, Ontario M9W-5L7
Canada
Phone: 416-675-5061
Fax: 416-675-6681

This international DACUM exchange has collected, stored, and distributed charts developed all over the world since 1971. The nominal price for each chart or task list is $3.50 (CAN), which covers the cost of postage and duplication. After contributing to the exchange, there is no cost for reasonable requests.

Also, many state curriculum labs collect DACUM charts produced within the state for distribution to other schools and colleges.

Task H-4. Acknowledge Contributors to the DACUM Process

The importance of acknowledging the contributions made by various persons to the DACUM should be obvious. Simply put, without the support of the committee members, their supervisors, their employers, and others, you could not have conducted the DACUM. During the DACUM workshop, you may want to collect information about key persons whom the committee members believe should receive a copy of the DACUM chart and a thank you letter. See page C-24 for sample Committee Member Data Form.

Some of the contributors needing to be acknowledged may be included in the chart distribution list discussed in Task H-3. The important thing is not to overlook thanking anyone who has contributed to the success of your DACUM activities.

Task H-5. Consult on the Application of DACUM Results

Depending on the institutional situation, the role of a DACUM facilitator is essentially completed. The role may shift to involvement, however, with one or more of the activities that should follow dissemination of the chart. At this point, the facilitator becomes more of a program developer or curriculum specialist, working with the instructor(s) and other instructional development team members to implement the changes needed.

This is no single best way to institutionalize the use of DACUM charts. Most institutions use teams to revise their existing curricula or to develop an entirely new education or training program based on the DACUM findings.

Task Analysis

One highly recommended additional analysis activity is **task analysis**. The person who is interested in an in-depth understanding and hands-on experience with this and the many other components of the SCID (Systematic Curriculum and Instructional Development) model (see page 20), should consider enrolling in one of the Center's SCID Curriculum Development Workshops.

Upon completion of the DACUM occupational analysis, many institutions conduct task analysis, which involves analyzing each verified task in order to identify (1) the steps involved, (2) the performance standards expected, (3) the tools and materials needed, (4) the related knowledge required (5) any safety concerns, (6) the attitudes involved, and (7) the decisions, cues, and errors involved. This process serves several very important purposes, the most important of which is to provide teachers and others with a more detailed basis for developing instructional materials.

More importantly, however, it helps the curriculum developer(s) to identify the relative "size" of the tasks (competencies) listed. No matter how carefully defined and structured the analysis process is, competencies inevitably vary in size and scope (i.e., in the amount of time and effort required to teach or to learn that competency). By analyzing each competency, one can identify the number and nature of the steps involved and remedy these inconsistencies. A sample task analysis form that has proven useful to both instructors and curriculum developers is presented along with an illustration of a complete analysis on the task of "mow the lawn" on pages H-9 to H-12.

Professional Development

Beginning facilitators should ask an experienced facilitator to observe and evaluate their performance in facilitating a DACUM workshop. They should also consider submitting copies of their first few analyses to experienced facilitators for constructive critiquing. The bibliography includes a growing list of useful DACUM references.

Two additional activities are highly recommended. One is to pursue the higher levels of DACUM Facilitator Certification offered by the Center on Education and Training for Employment at The Ohio State University (see page H-13). The second is to attend the annual DACUM Invitational Seminar conducted by the Center for "trained and experienced facilitators only." It is conducted prior to the American Vocational Association Convention each year, around the first week of December. It offers facilitators an excellent opportunity to update their skills and knowledge and to hear firsthand about the many ways DACUM facilitators in business and industry, schools and colleges, and various government agencies are making DACUM work for them (see page H-15 for sample flyer.)

Task H-6. Identify Customer Need for Assistance Beyond DACUM

Even before the DACUM workshop, you should review with your customer the components of the SCID Curriculum Development Model (see page 20) to help the client clearly understand how the DACUM workshop fits into a larger, comprehensive process. You may want to review and discuss this model further with your customer during or soon after the workshop. In doing this, be sure to:

a. Determine your client specific objectives
b. Determine which curriculum components (e.g., task verification, task analysis, developing performance measures) the customer is skilled in performing.
c. Determine which components the customer would like to receive training or technical assistance in, if any, and which components the customer would like to contract out, if any.

Seize the opportunity to be of further service where the customer wants assistance or to contract out. Having facilitated the DACUM workshop, you have an excellent, highly competitive knowledge base upon which to base your proposal to assist. Customize your recommendations to the client's needs and present them in a well-written and cost-effective proposal. If possible, give the names of other satisfied customers as references, and show your client samples of the products developed for others.

DACUM has proven itself an effective, and viable alternative to traditional occupational analysis procedures. Thanks to the dedication of highly trained and qualified facilitators, its low cost, high quality, and effectiveness have been widely recognized in the United States and in more than 25 other countries.

STANDARD TASK ANALYSIS FORM

Duty: ______________________________

Task: ______________________________

Expert Workers: ______________________________

Recorder: ____________________ Date: ____________

STEPS (Required to Perform the Task)	PERFORMANCE STANDARDS (Observable & Measurable Criteria)	TOOLS, EQUIPMENT, MATERIALS, & SUPPLIES (Needed)	REQUIRED KNOWLEDGE (Math, Science, Language, & Technology)	SAFETY (Concerns)	ATTITUDES (Important to Worker Success)

DECISIONS	CUES	ERRORS
Identify Decisions that Must be Made by the Worker	Identify the Data Needed for Making Correct Decisions	Indicate What May Result if Incorrect Decisions are Made

STANDARD TASK ANALYSIS FORM

Duty: MAINTAIN THE HOME YARD

Expert Workers: Steve Brown, Glenn Maxon

Task: MOW THE LAWN

Recorder: Robert E. Norton

Date: 9/22/95

STEPS (Required to Perform the Task)	PERFORMANCE STANDARDS (Observable & Measurable Criteria)	TOOLS, EQUIPMENT, MATERIALS, & SUPPLIES (Needed)	REQUIRED KNOWLEDGE (Math, Science, Language, & Technology)	SAFETY (Concerns)	ATTITUDES (Important to Worker Success)
1. Remove mower from storage.		1. Mower		1. Do not damage car or other items	1. Cautious and careful
2a. Check/add oil b. Check/add gas	2a. 1) Checked oil level 2) Added correct amount and type of oil, if needed b. 1) Checked gas level 2) Filled gas tank, if needed	2a. 1) Rag or paper towel 2) Correct type oil b. 1) Gas can 2) Correct type gas	2a. 1) Location of oil level measure 2) Read oil level measure 3) Type of oil needed b. 1) Location of gas tank 2) Determine gas level 3) Type of gasoline appropriate, or gas/oil mixture ratio	2a. 1) Be careful not to spill or waste oil 2) Be careful not to overfill engine b. 1) Be careful not to spill gasoline 2) Avoid sparks or touching hot surfaces	2. Cautious and careful
3a. Check/adjust cutting height b. Attach bagger, if desired	3a. Adjusted mower to desired cutting height b. Attached bagger unit, if desired	3a. Ruler b. Bagger unit	3a. Read ruler/owner's manual b. Attach bagger unit correctly	3. Avoid cuts	3. Concern for Quality
4. Determine mowing pattern	4. Mowed lawn in pattern requested	4.	4. Available patterns and benefits of each	4.	4.
5. Start mower	5a. Choked engine, if cold b. Adjusted gas to recommended setting c. Started engine quickly	5. Owner's Manual	5a. Basic principles of engine operation b. Location and operation of choke and throttle	5. Locate on flat surface free of objects	5. Concern for safety of self and others
6. Guided mower safely over the lawn	6a. Guided the mower safely by: 1) wearing proper clothing 2) removing any objects from lawn 3) keeping children & animals a safe distance 4) proceeding at safe speed for conditions b. Mowed the entire lawn	6.	6a. Safe lawn mowing procedures b. What objects constitute danger	6. Watch for safety of children, adults, other animals	6. Safety conscious
7. Shut off mower	7. Turned off engine promptly	7.	7a. Location of off-switch b. Appropriate cleaning procedure	7. Avoid touching hot surfaces	7. Safety conscious
8. Dispose of clippings	8a. Properly disposed of clippings b. Prepared mower for storage	8a. Contain for clippings b. Broom and rags	8. Clipping disposal options	8.	8.
9. Return mower to storage	9. Returned mower to storage area	9.	9. Store mower safely	9. Avoid damage to mower and adjacent objects	9. Safety conscious
10. Collect mowing fee (if appropriate)	10. Collected appropriate fee for services	10.	10. Calculation of correct mowing fee	10.	10. Courteous, appreciative

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DECISIONS	CUES	ERRORS
Identify Decisions that Must be Made by the Worker	Identify the Data Needed for Making Correct Decisions	Indicate What May Result if Incorrect Decisions are Made
1.	1.	1.
2a. Whether to add oil, and if needed, the amount and type b. Whether to add gas, and if needed, how much	2a. Reading from the oil dipstick b. Gas gauge or other measure	2a. Could damage or destroy engine b. 1. Run out of fuel 2. Clog fuel system
3a. Determine best cutting height b. Whether to bag clippings	3a. Owner's manual and customer preference b. Owner preference	3a. 1. Dissatisfied customer 2. Damage to lawn health b. Dissatisfied customer
4. Decide on best mowing pattern	4. Owner's manual & owner's preference	4. Dissatisfied customer
5. Decide on amount to choke	5. Owner's manual & condition of engine	5. Engine won't start
6. How to operate safely	6. Owner's manual	6. Loss of customer
7.	7.	7.
8. Determine how best to dispose of clippings	8. Owner's preference	8. Dissatisfied customer
9. Decide on best storage area	9. Owner's preference or previous location	9. Dissatisfied customer
10. Determine reasonable and correct fee	10. Going rates in the area	10a. Worker loses money b. Customer unhappy with excessive fee

CETE ANNOUNCES DACUM CERTIFICATION

CETE offers three types of DACUM certification.

The first level of DACUM certification is awarded for successful completion of our **DACUM Facilitator Training Institute**. This certification certifies that you completed training successfully and are ready to conduct workshops in your school, college, company, or agency.

The second level of DACUM certification is as a **Certified DACUM Facilitator**. This type of certification is open to anyone who meets specified criteria via the following process:

a. Conduct a minimum of three regular two-day DACUM-type job analysis workshops
b. Submit a copy of each DACUM chart produced to CETE for a written review and critique by two qualified staff or consultants
c. Duty and task statements must meet CETE specified (DACUM Handbook) standards
d. Submission along with the three DACUM charts, a letter of intent to obtain certification, information about the DACUM training received, and a check or purchase order for $300.00.
e. Persons whose charts meet specified criteria and who pay the required fee will be issued a frame able certificate specifying the person's completion of a performance-based certification procedure.

The third type and level of certification offered is as a **Certified DACUM Facilitator Trainer.** This type of certification will require completion of the following processes:

a. Obtaining qualification as a **Certified DACUM Facilitator**
b. Conducting a minimum of five additional DACUM job analysis workshops including submission of the related charts produced. The charts must meet established CETE DACUM standards.
c. Submittal of a written critique of three DACUM charts sent to the candidate by CETE.
d. Submission of a 1-2 hour videotape (½" VHS) which includes both an orientation and a task identification sequence (minimum of 30 minutes length). The chart resulting from the videotaped workshop must be one of those submitted for critique.
e. Submission along with the five DACUM charts for review, a letter of intent to obtain "facilitator trainer" certification, and a check or purchase order for $750.00.

Submit all DACUM certification materials to:

Dr. Robert E. Norton
DACUM Program Director
CETE/OSU
1900 Kenny Road
Columbus, OH 43210

231

2/96

DACUM
INVITATIONAL SEMINAR

Join With the DACUM Experts - Learn About the Latest Techniques for Using DACUM and its many applications in business, industry, education, government, and the military.

Register Today!

The **DACUM Invitational Seminar** is designed for persons who have been trained to use **DACUM** and have been involved in organizing and facilitating **DACUM** workshops.

How to Register. Please mail your registration to the address given or fax your registration to 614-292-1260, Attn: Bob Norton. If you have questions, call our office toll-free number **800-848-4815** or **614-292-4353, Ext. 4-7667**. This seminar is offered on a cost-recovery basis; thus, a minimum number of participants is needed to conduct this program.

Stay on the Cutting Edge

Learn how others are successfully using the results of DACUM to develop curriculum materials for both the classroom and on-the-job training settings. Learn about:

- Conducting process analysis to help meet ISO 9000 standards
- Using DACUM for **Tech Prep** and **School to Work** programs
- Using the DACUM process for functional analysis
- Selecting the right panel
- Using different facilitation techniques for identifying high-quality task statements
- Building rapport with business and industry
- Using DACUM as a basis for competency testing
- Converting task statements into competencies and courses
- Using the results of DACUM for worker certification.

Ways You Will Benefit

1. Acquire some new facilitation skills and techniques.
2. Encounter the most up-to-date thinking about new DACUM applications.
3. Learn about new strategies and practices to help make your job easier and more efficient.
4. Enhance facilitation skills already possessed.
5. Learn what analysis strategies have worked at institutions and companies comparable to yours--and what roadblocks have been encountered.
6. Join the "DACUM network" by linking with facilitators nationwide and internationally.
7. Interact with other professionally trained facilitators.
8. Obtain materials that you can apply to your immediate situation.
9. Be energized by the latest thinking of fellow expert facilitators using the DACUM process.
10. Connect with DACUM experts from other colleges, companies, agencies, and countries!
11. Learn how computers can be used to support the DACUM process.
12. Learn about using DACUM internationally.

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This seminar will give you the most up-to-date information on using the DACUM Process in educational agencies, business and industry, and government agencies.

Attend the DACUM Invitational Seminar

There will be . . .

Opportunities to meet and share your views with other professionally trained DACUM facilitators, new faces, and old acquaintances. There will be many presentations and discussion sessions. You will learn how you can apply new principles and practices, and much, much more. Share your views and hear the latest on . . .

Evidence that DACUM is working successfully in keeping programs current, increasing program effectiveness, building strong cooperative relationships with business and industry, and saving **time and money**. And there will be a wealth of . . . .

Discussion and information sharing on new and innovative strategies–what works and what doesn't work. There will also be opportunity to. .

Generate new, practical, proactive strategies that will be effective at your company or institution. And there will be an . . .

Exchange table so you can trade DACUM charts and other materials with your colleagues.

Persons from many community colleges, government agencies, and many companies like General Motors, Dofasco, Monsanto, and Ericsson plan to attend and, in most cases, also present. We also expect persons from Canada, Turkey, and other countries.

We hope you will plan to attend! We know you'll be delighted. We have much to gain from your presence.

Annual DACUM Invitational Seminar
Plan Now to Attend To Help You Stay on the Cutting Edge

DACUM INVITATIONAL SEMINAR
REGISTRATION FORM

Name ______________________________

Position ______________________________

Company/College ______________________________

Business Address ______________________________

City ______________ State _____ Zip _______

Phone Number (   ) ______________________

____ Check enclosed in the amount of $__________ made payable to the Center on Education and Training for Employment at The Ohio State University.

____ Purchase Order # ______________________

____ Please charge to my credit card:

______________ Master Card ______________ VISA

Account # ______________________________

Signature ______________________________

Name on Card ______________________________

Expiration Date ______________________________

Fax Number (   ) ______________________

Mail your request to the Center on Education and Training for Employment, The Ohio State University, 1900 Kenny Road, Columbus, OH 43210 or fax to 614-292-1260, ATTN: Robert E. Norton.

BEST COPY AVAILABLE

REFERENCES

(With emphasis on the DACUM methodology)

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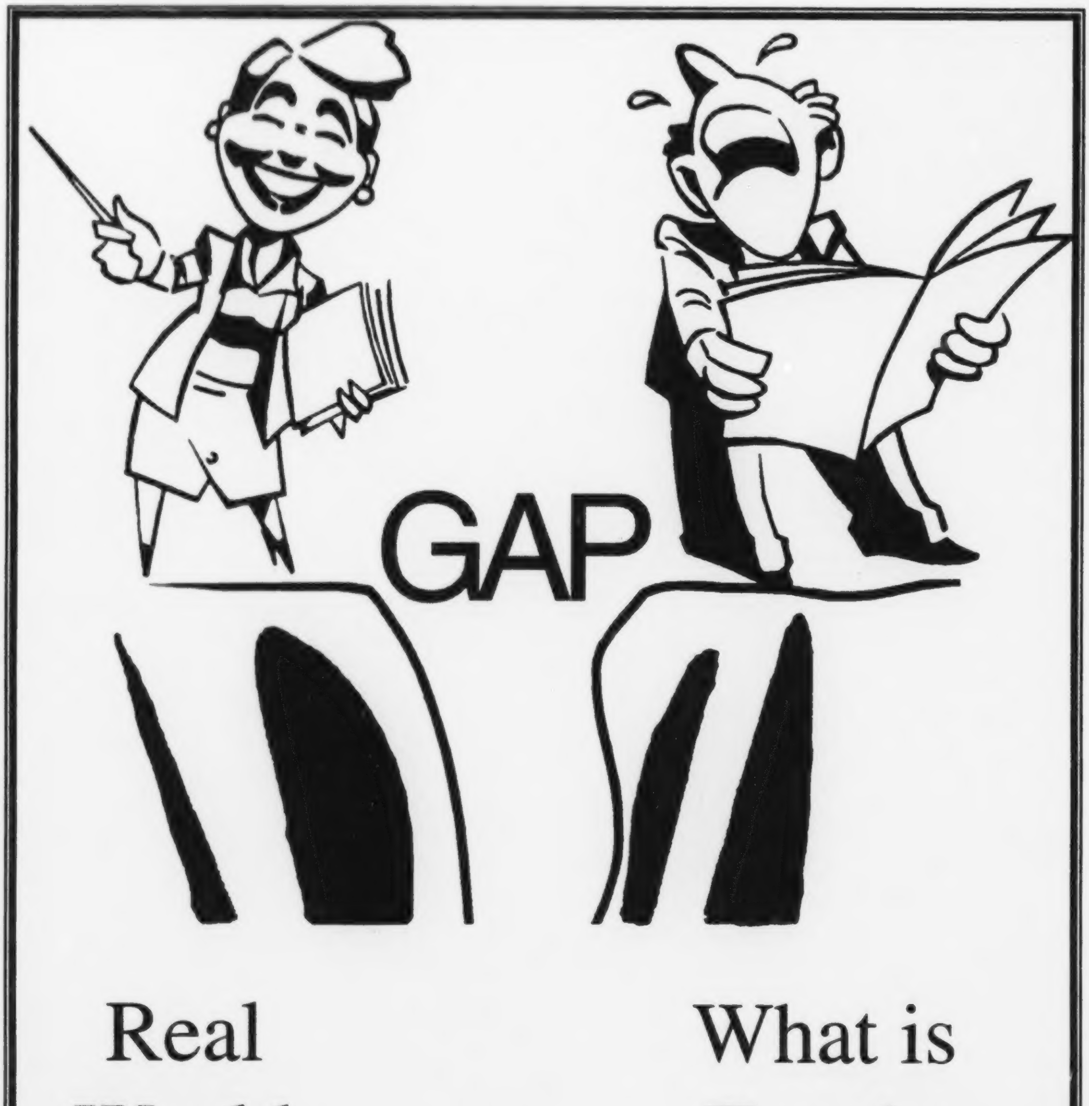
Appendices

Appendix A - DACUM Transparency Masters
Appendix B - The Nature of Task Statements
Appendix C - DACUM and CBE Terminology
Appendix D - CBE: An Effective and Realistic Approach to Education and Training
Appendix E - Brief History of DACUM
Appendix F - Potential Problems in Working with DACUM Committees

Appendix A

DACUM Transparency Masters

DACUM


GAP
Real World
What is Taught

CURRICULUM

- Accounting
- Advertising
- Auto Mechanics
- Computers

?

- Data Processing
- English
- Math
- Sales

Should We Teach -

- ➢ What we know best?
- ➢ What we were taught?
- ➢ What we enjoy teaching?
- ➢ What we have experience with?
- ➢ What the textbook happens to include?

— or ————————————

- ➢ What the student/worker most needs for successful employment?

Curriculum "What" Errors

- Failure to teach WHAT should be taught
- Teaching WHAT should not be taught

DACUM reduces these errors significantly

What is DACUM?

An Acronym for Developing A CurriculUM

A Process for: (1) Job Analysis
(2) Occupational Analysis
(3) Process Analysis
(4) Functional Analysis

Used by: Vocational-Technical Educators
Business-Industry Trainers
Government-Military Agencies

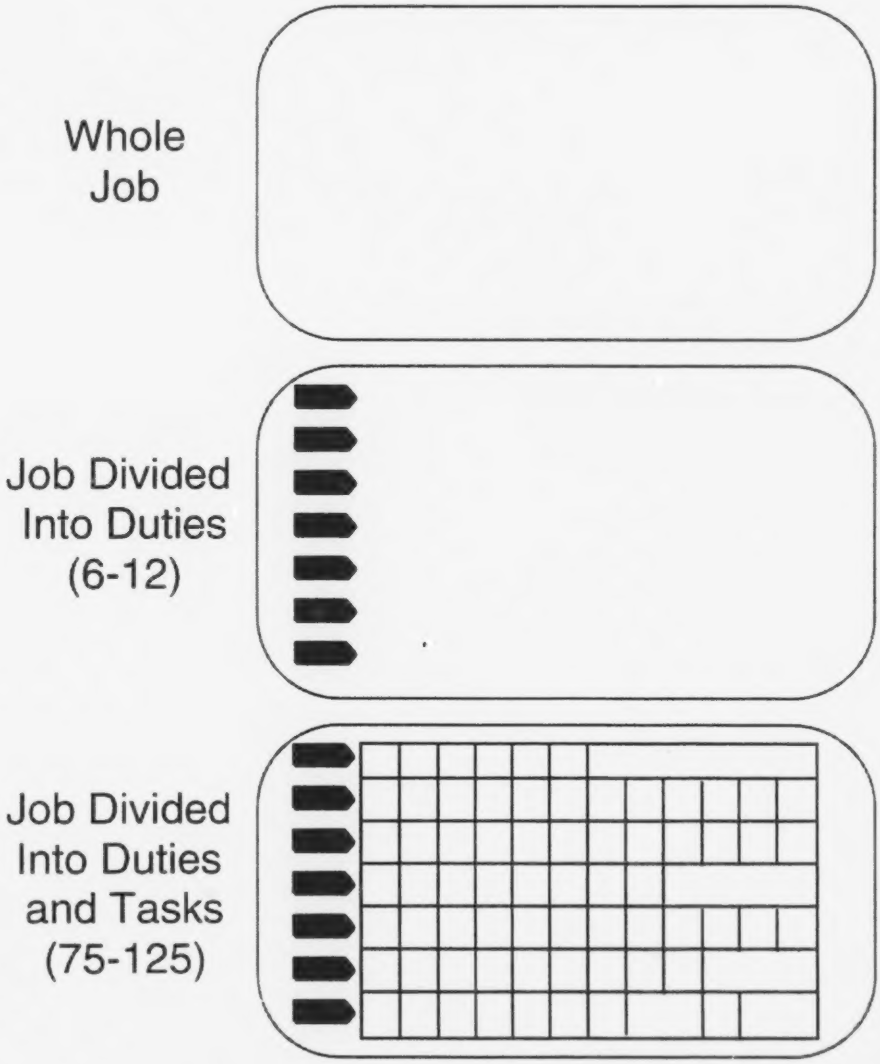
Used because its: Effective
Quick
Low Cost

DACUM Philosophy

- ➢ Expert workers can describe and define their job more accurately than anyone else
- ➢ An effective way to define a job is to precisely describe the tasks that expert workers perform
- ➢ All tasks, in order to be performed correctly, demand certain knowledge, skills, tools, and worker behaviors

DACUM

Graphic Representation of Job, Duty, and Task Relationships


Whole Job
Job Divided Into Duties (6-12)
Job Divided Into Duties and Tasks (75-125)

DACUM

Key Terms

➢Duties	A cluster of related tasks Usually 6-12 per job
➢Tasks	Specific meaningful units of work Usually 6-20 per duty and 75-125 per job
➢Steps	Specific elements or activities required to perform a task Always two or more per task

Job, Duty, Task, and Step Examples

JOB - Homeowner
DUTY - Maintain the yard
TASK - Mow the lawn
STEP - Start the mower

JOB - Homemaker
DUTY - Prepare meals
TASK - Bake cookies
STEP - Mix ingredients

DACUM

Job, Duty, Task, and Step Example #2

JOB - Car Owner
DUTY - Maintain the vehicle
TASK - Change motor oil
STEP - Drain old oil

JOB - Parent
DUTY - Clothe children
TASK - Buy school clothes
STEP - Select correct sizes

DACUM

Duty Statement Guidelines

Duty Statements:

- Describe large areas of work in performance terms
- Serve as title for a cluster of related tasks (usually 6-20/duty)
- Consist of one verb, an object, and usually a qualifier
- Are general, not specific, statements of the work that is performed (usually 6-12/job)
- Stand alone (are meaningful without reference to the job)
- Avoid references to workers behaviors, tools, and knowledge needed

DACUM

Developing Task Statements

The Components of a Task Statement are:

Verb	The verb must be in the first person singular, active voice. (e.g., select, prepare, maintain, develop, determine)
Object	The object is the thing acted upon by the worker. (e.g., reports, equipment, records, customers)
Qualifier	Qualifiers are words or phrases used to modify and clarify the task statement. (e.g., ... record "health" history; develop a "financial" plan, bake "oatmeal raisin" cookies, weed the "flower" garden)

DACUM

Job Task Criteria

Job Tasks:

- Represent the smallest unit of job activity with a meaningful outcome
- Result in a product, service, or decision
- Represent an assignable unit of work
- Have a definite beginning and ending point
- Can be observed and measured
- Can be performed over a short period of time
- Can be performed independent of other tasks
- Consist of two or more steps

Task Statement Criteria

Task Statements:

- Concisely describe a task in performance terms
- Should have a single action verb and an object that receives the action
- Usually contain one or more relevant qualifiers
- Are explicitly stated (crystal clear)
- Are meaningful by themselves (not dependent upon the duty or other tasks)
- Avoid references to worker behaviors needed
- Avoid references to tools and equipment that merely support task performance
- Avoid references to the knowledge needed

DACUM Procedural Steps

1. Orient the committee
2. Review the job/occupation:
    a. Conduct initial brainstorming
    b. Develop organizational chart
3. Identify duties (general areas of responsibility)
4. Identify specific tasks performed
5. List:
    a. General knowledge and skill requirements of the job
    b. Worker behaviors (desirable attitudes and traits)
    c. Tools, equipment, supplies, and materials
    d. Future trends/concerns
6. Review/refine task and duty statements
7. Sequence the task and duty statements
8. Other options as desired

DACUM

Workshop Ground Rules

- Rank and seniority are left at the door.
- Everyone participates equally.
- Share ideas freely.
- One person speaks at a time.
- Keep on track.
- Hitchhike on each other's ideas.
- Provide constructive suggestions rather than criticisms.
- Consider all task statements carefully.
- Don't use references.
- Observers cannot participate.
- Have fun!

The Most Important Question a DACUM Facilitator Can Ask is...

“What do you do?”

???

Ask it over and over!

The Most Valuable Skill You Can Develop and Use as a Facilitator is Your Oral Questioning Skill.

You need to probe, probe, and probe some more!

Some Task Statement Guidelines

- Avoid generality - when in doubt, break it out
- If different knowledge and skills are involved, it's a different task
- Use (e.g., ____) sparingly, but whenever it will help clarify task meaning
- When sequencing, letter the duties in place, but always move the tasks
- When refining tasks, explain the facilitator's role change and challenge the panel on all unclear tasks

DACUM

Things to Avoid

Use of:

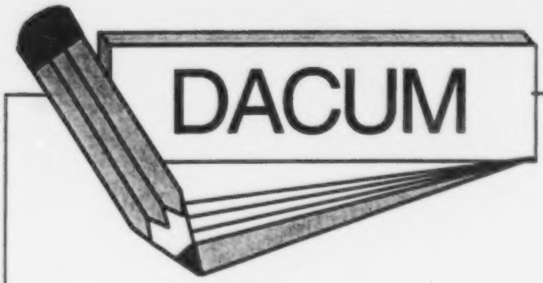
- simple action verbs
- multiple-verb task statements
- two-word task statements
- unnecessary modifiers
- skill statements
- "operate" and "use" as action verbs for duties or tasks
- "communicate" or "communicate with others" as duty or task verbs
- vague occupational definition when selecting committee members

Things that Help

- Conducting a short ice-breaker exercise
- Conducting free brainstorming during the review of job and the identification of tasks for each duty
- Developing an organizational chart during the review of job
- Reviewing a sample, high quality, unrelated DACUM chart during orientation
- Having a host agency representative explain why the DACUM is being conducted
- Seeking early input from each committee member
- Sincerely complimenting the committee as much as possible
- Never getting angry at or critical of committee members

DACUM Standards

- All duty and task statements abide by accepted criteria.
- Task statements contain a single verb, and object, and usually one or more qualifiers.
- The same task appears only once.
- The duties and tasks are logically sequenced .
- Separate lists are developed for:
  - General knowledge and skills;
  - Worker behaviors;
  - Tools, equipment, supplies, and materials;
  - Future trends/concerns.
- A majority of the committee represents expert workers.
- The facilitator is qualified through training and practical, supervised experience.
- There are 6 to 12 duty areas and 6 or more tasks in each duty.



The DACUM Components

- JOB ANALYSIS--Developing of precise duty and task statements; and the identification of important knowledge and skills, tools and equipment, worker behaviors, and future job/occupational trends

- TASK VERIFICATION--Obtaining ratings of task importance and learning difficulty from many experts

- TASK ANALYSIS--Identifying task steps, performance standards, required knowledge, important attitudes, decisions/cues/errors, tools/equipment/supplies, and safety factors

Major DACUM Workshop Outcomes

- Precisely stated job tasks/duties
- General knowledge and skills
- Worker behaviors
- Tools, equipment, supplies, and materials
- Future trends/concerns
- Terms/Acronyms (optional)

DACUM Advantages

- Group interaction
- Brainstorming power energized
- Group synergy
- Group consensus
- Comprehensive outcome
- Superior quality
- Future oriented
- Employer/trainee buy-in

DACUM Process

(As summarized by GM trainers)

- ➢Solid foundation for development
- ➢Efficient: 2 days vs. 6 weeks
- ➢Specific vs. general job specifications
- ➢Employee involvement and buy-in
- ➢Use of expert panel members
- ➢Identification of critical tasks
- ➢Opportunity for sharing ideas

DACUM:
Some Company Users

☑ American Electric Power

☑ AT&T

☑ Blue Cross/Blue Shield

☑ Champion International

☑ Dofasco

☑ Eastman Kodak

☑ Ericsson

☑ General Electric

☑ General Motors

☑ James River

☑ John Deere

☑ Lucent Technologies

☑ Monsanto

☑ Motorola

☑ Navistar (International)

☑ Roadway Express

☑ UAW-Ford

☑ United Airlines

☑ Virginia Power

☑ Walt Disney World

☑ Yellow Freight

DACUM:
Some University Users

- ☑ Johnson and Wales
- ☑ Ohio State
- ☑ North Dakota State
- ☑ Bowling Green State
- ☑ Temple University
- ☑ Ferris State
- ☑ Indiana University of Pennsylvania
- ☑ Oklahoma State University
- ☑ University of Central Florida

DACUM:
Some Country Users

- ☑ Chile
- ☑ Australia
- ☑ New Zealand
- ☑ Canada
- ☑ Sweden
- ☑ Turkey
- ☑ Philippines
- ☑ Malaysia
- ☑ Fiji
- ☑ Singapore
- ☑ Sri Lanka
- ☑ Mauritius
- ☑ Krygyzstan
- ☑ Venezuela
- ☑ Indonesia
- ☑ China
- ☑ Korea
- ☑ Netherlands

DACUM

DACUM Enables Schools and Colleges To:

- Substantively involve business and industry in program development
- Develop accurate job-competency information for teachers, instructors, and program developers
- Revise and update existing program/curricula
- Identify curriculum support needs--tools, equipment, materials, and supplies
- Develop job profiles within larger occupational clusters for Tech-Prep, etc.

DACUM Enables Schools and Colleges To: (continued)

- Solicit contributions (equipment, time, etc.) from business and industry
- Establish a solid and extensive network for job placement, information sharing, business-industry, and other collaborative activities
- Establish personal contacts for information sharing, business-industry, and other collaborative activities
- Develop accurate information for counseling students

DACUM

DACUM Enables Business and Industry To:

- Design new training programs quickly and cost-effectively
- Assess relevance of existing training programs
- Reduce costs and start-up time for design and delivery of training programs
- Conduct a high quality occupational analysis in two days instead of 30 or more days
- Obtain significant employee involvement and buy-in
- Collect quickly and efficiently the information needed for developing
- relevant training materials

DACUM

DACUM Enables Business and Industry To: (continued)

- Identify training program support needs--tools, equipment, materials, and supplies
- Provide a legally defensible basis for developing competency/performance tests
- Participate directly in development of college/school training programs
- Develop descriptions for new or existing jobs
- Meet ADA job description
- requirements
- Describe job operations and job systems so as to meet ISO 9000 requirements

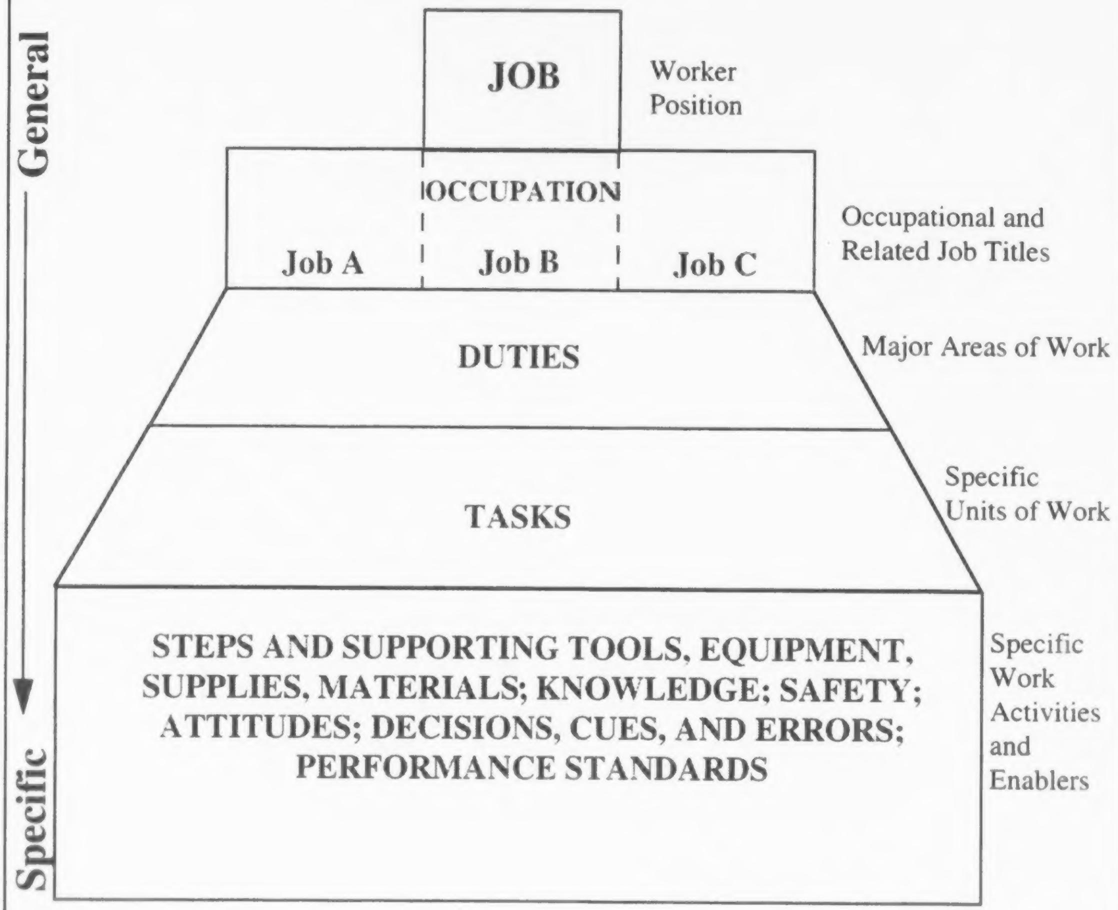
DACUM

What Should Be Taught?

- This very important question has to be answered by someone or some group for every training and educational program offered.
- How do you answer it in your school, college, company, agency, or business?

DACUM

DACUM Terms and Their Relationships



General

Specific

JOB

Worker Position

OCCUPATION

Job A

Job B

Job C

Occupational and Related Job Titles

DUTIES

Major Areas of Work

TASKS

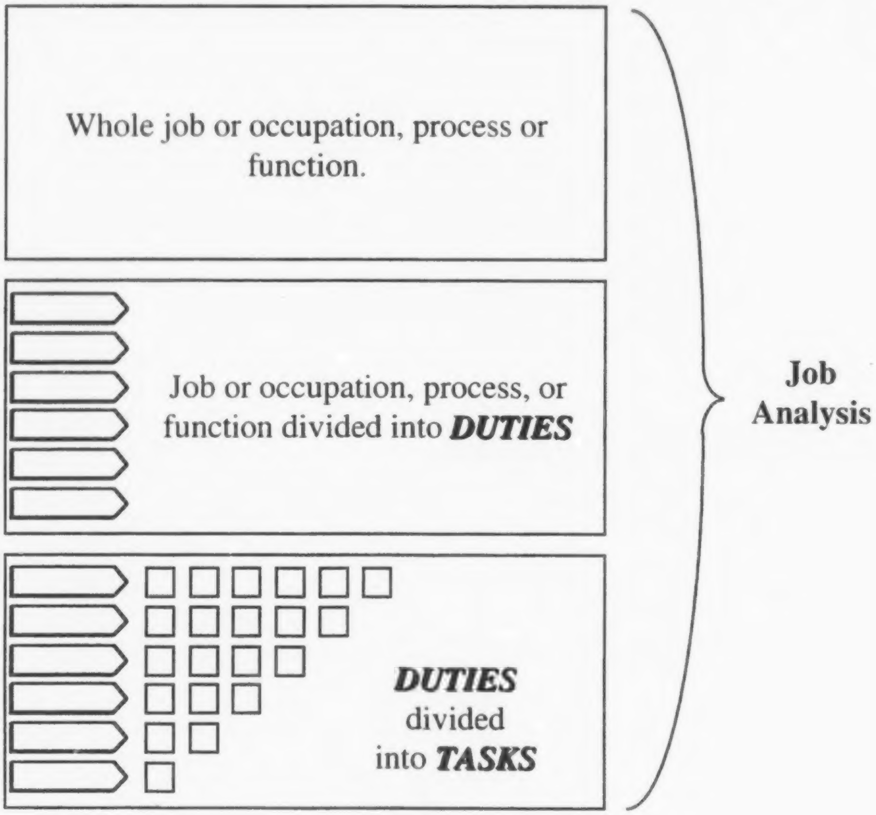
Specific Units of Work

STEPS AND SUPPORTING TOOLS, EQUIPMENT, SUPPLIES, MATERIALS; KNOWLEDGE; SAFETY; ATTITUDES; DECISIONS, CUES, AND ERRORS; PERFORMANCE STANDARDS

Specific Work Activities and Enablers

DACUM

Job and Task Analysis



Whole job or occupation, process or function.

Job or occupation, process, or function divided into ***DUTIES***

DUTIES divided into ***TASKS***

Job Analysis

Task Analysis

Task:______________________________

Steps:	Performance Standards	Tools, Equip., Supplies, Materials	Knowledge	Safety	Attitudes	Decisions, Cues, & Errors
1.						
2.						
3. ↓						

Appendix B

The Nature of Task Statements

This appendix consists of an edited and adapted excerpt from Performance Content for Job Training, Volume 2: Stating the Tasks of the Job, by Harry L. Ammerman (Research and Development Series No. 122. Columbus: The Center for Vocational Education, The Ohio State University, 1977). Adapted by Robert E. Norton, 1996.

Definition of a Task

A task is a meaningful unit of work, generally performed on the job by one worker within some limited period of time. It is a purposeful job-oriented activity of a worker.

Each task performed by workers in an occupation should be a logically differentiated segment of work activity. In content, a "task" is generally said to be a job activity intermediate in specificity between a "duty or responsibility" and a "procedural work step or action." It is a discrete unit of activity and represents a composite of methods, procedures, and techniques which commonly serve to accomplish one meaningful unit of work. Tasks involve worker interaction with such objects and elements as equipment, materials, other people, animals, information, ideas, data, events, and conditions. In most instances, the performance of a task by a worker has a reasonably definite beginning and end, the whole activity requiring a mixture of decisions, perceptions, and/or physical actions serving a useful job purpose or a particular work assignment.

Some Things that are Not Tasks

1. **Worker qualifications** (such as intelligence, aptitude, education, skill, training, and experience) are not tasks; nor are they any component of a task statement.

2. **Worker behaviors** such as traits and attitudes that help support quality performance are not tasks. Being positive, a team player, cooperative, tactful, etc. are very important supportive behaviors allowing workers to be successful, but they are enables and not tasks.

3. **Job responsibilities, position assignments, and work goals** are not tasks. Although part of a total description of the work, they provide sources and justification for tasks, but they are not tasks in themselves.

4. **Responsibilities and functions** of an agency, shop, team, or office are not tasks. Tasks are activities of people, not of organizations.

Structure of a Task Statement

To provide a basis for decisions on the curriculum content of training programs, statements of tasks should have a certain grammatical structure and conform to several characteristics. Brevity and clarity are the foremost considerations. Task statements also should conform grammatically, represent a specific unit of purposeful job activity, and use terminology that is generally current and meaningful to persons close to the occupation.

The sections below describe the structure and characteristics of task statements that you need to know to be an expert DACUM facilitator. These are followed by a section dealing with some of the problems in stating tasks. The guidelines and directions provided are not inviolate requirements, but point the direction to pursue in order to be most beneficial for subsequent users of the statements.

Each statement of a task is composed of three basic elements:

1. A specific **action verb**, descriptive of what is done.
2. A brief identification of what is being acted upon; the **object of the action verb.**
3. Whatever **qualifying words or phrases** may be needed to clearly distinguish the task from related or similar activities, or to limit and define the scope of concern.

Thus, task statements are simple declarative statements. They typically start with an action verb in the present tense, with the subject of the sentence understood to be **"I"** (so that the statement makes personal sense to a worker who may be asked about what he/she does on the job). The following are examples of task statements, with several showing the use of meaningful qualifiers:

Action	**Qualifier**	**Object**
Develop	lesson	plans
Replace	brake	shoes
Type	financial	reports
Assess	worker	performance
Repair	flat auto	tire

The essential characteristics of all task statements are they be brief and clear. A task statement should have essentially the same meaning for anyone having a reasonable knowledge of the occupation.

When used in reaching decisions about content for training, it is also necessary that task statements be specific and reflect only one meaningful unit of work activity. When used only to differentiate between related types or levels of workers in an occupation field, then somewhat broader statements of work activity may be adequate.

Task Statement Guidelines

A task statement should conform to the following guidelines:

1. **Grammatical Conformity**. Guidelines described above should be followed. It is not necessary for an action verb to have the same identical meaning every time it's used, as long as the meaning is clear within the context of use. Thus, **no** standard list of verb definitions needs to be followed.

2. **Performance Specificity**. A task statement tells **what** work is done, not **how** or **why** it is done. Several points need to be observed to assure that a task is stated at an appropriate level of specificity:

   a. Avoid activities that are obviously **too specific** or **too trivial**. For example, "Transmit phone messages" is acceptable, but **not** "Dial operator," or "Look up phone number in directory." The last two items are probably steps of the task.

   b. Avoid activities that are **too general**. Task statements should be able to differentiate between:

      1) Different levels of workers in a career ladder (for example between apprentices, journey persons, and technical supervisors, or between supervisors and managers).

         Thus, a skilled worker may perform an operational check on a piece of equipment, whereas a supervisor may only observe that the results of the check are within prescribed tolerances.

      2) Different job types within an occupational field (for example, between various secretarial positions such as General Secretary, Executive Secretary, Legal Secretary, Administrative Assistant, and Clerk Typist).

         Thus, statements like "Type legal leases" and "Type medical records of patients" would differentiate between the tasks (and training required) of legal and medical secretaries, whereas "Type on printed forms" or "Type standardized formats" would not.

   c. In general, avoid **multiple verbs** in a task statement unless several actions occur simultaneously or are performed together. For example, "Repair/replace car alternator" is appropriate.

   d. In general, avoid **multiple objects** unless the objects are acted upon together, or unless the multiple activities are sufficiently similar so as to require comparable training. Multiple objects used to clarify or give examples are acceptable. For example, "Type index cards and file cards."

e. In general, avoid joining more than one activity statement into a single task statement, unless there is a brief and clear way to state a single meaningful unit of work. Accordingly, "Replace belts" and "Clean engine parts" are acceptable, but not "List contents of office safe and keep it up-to-date."

f. Avoid statements of larger activities or functions which may involve a number of tasks. For example, "Replace injectors" is preferable to "Repair fuel systems." Each task described by a statement should be independent; it should not overlap or be encompassed by a broader activity or function.

g. Each task statement should be capable of standing alone. For instance, in the context of a duty concerning automotive air conditioners it might seem sufficient to simply state a task "Service control cables and switches." But for the statement to make sense when it later may have to stand alone, "Service air conditioner control cables and switches" would be preferable.

The **concern for level of specificity should not be taken to extremes**. No harm is done if the larger activities should be included. It is just wasteful of time and effort to do so. When it becomes difficult or time consuming to sort out the large activities, include those on which decisions cannot readily be made. Subsequent reviews may provide further clarification of specific activities, permitting broader activities to be eliminated. It should be remembered that level of specificity varies somewhat as a function of the occupation being described. For instance, the statement "Clean up the work area" might represent a specific task for a secretary or mechanic, but for janitors or clean-up personnel, it likely would represent a much larger work function.

3. **Generally Used Terms**. Tasks should be stated using terminology consistent with current usage in the occupational area. Overly technical jargon as well as obsolete terms, unless needed to communicate clearly with others, should be avoided.

   Use of Abbreviations. Abbreviations and acronyms should be used cautiously since they may not be understood by all workers in an occupation. However, in some cases they may be preferred, as when workers understand the abbreviation but not the technical term behind it. Somewhere on the job analysis, all acronyms used should be defined.

4. **Job-Oriented Activity**. In stating job activities, a distinction often can be made between **what a worker does** and what gets done. Descriptions of what the worker does are called "worker-oriented" statements. Descriptions of **what gets done by the worker** are called "job-oriented" statements. For the most part, **task statements should be job-oriented.**

   Differences between the two types of activity statements may be illustrated by the statement "Process order forms." The processing of forms is what the worker gets done; hence, this is a job-oriented statement. But what the worker does may consist of *(a) reading the forms to highlight certain information contained in them, (b) reviewing them for accuracy and completeness,(c) comparing information on the forms against standards, or other such actions*. These worker-oriented activities may all be performed by the same person, or by several. Worker-oriented activities describe work activity in terms of what actions workers are performing, tending to indicate how a task gets done rather than **what** is accomplished.

Some Problems in Stating Tasks

For the most part, stating tasks is a reasonably straightforward process. However, occupations differ widely. Some are highly routine, characterized by a few obvious tasks performed in a described manner by all incumbent workers. Others are very nonroutine, with individual workers performing only some segments of the total set of tasks relevant to the occupation as a whole. Some occupations are more affected than others by new technologies and emerging sub-occupations or paraprofessional occupations. Equipment operators and repairers tend to perform observable tasks, whereas teachers, managers, politicians, writers, and scientists often concentrate on conceptual and cognitive types of work activity. These and other job variations can raise questions, such as those addressed below, about how to state tasks.

Use of Statement Qualifiers

Task statements should not have qualifiers unless they are essential to the meaning of the statement. For example, "Compute sales tax" is preferable to "Compute sales tax to determine amount of tax on sales." Conversely, "Schedule employees for on-the-job training" is preferable to "Schedule employees."

The use of qualifying phrases is governed by the general rule of doing what is necessary to be able to make specific decisions about training. If other than the intended training activities and learning could be implied by to brief a task statement, the statement needs modifiers.

If a modifier is needed for greater task specificity or to distinguish between similar activities, all other significant tasks with comparable modifiers should be listed. For example, the auto mechanic's task "Repair transmissions" might not be specific enough. If the statement were qualified to read "Repair automatic transmissions," then "Repair manual transmissions" should also be included among the task statements.

Another way of helping to clarify the intended meaning of task statements is to use e.g. (for example) and list some illustrative examples. For example, the task "Schedule DACUM workshop" may be made more explicit by saying "Schedule DACUM workshop (e.g., dates, times, location)."

Always avoid using redundant qualifying phrases, such as "when appropriate," "as required," "in accordance with prescribed procedures." These are always assumed to be true.

Treatment of Fringe Activities

Many job positions include some work assignments that do not necessarily relate directly to their job. They may be minor or occasional activities that form a part of the general employment situation, such as occasionally delivering material to a destination at the supervisor's request, or helping out for a day in another department. At other times, there may be fairly definite assignments of additional duties, such as serving as supervisor during temporary absences of the boss, serving as shop steward for the local union, serving as the office chairman of a charity drive, or serving as a member of a committee or board.

Each of these peripheral activities are on the fringe of the basic occupational definition. Yet for incumbent workers, such activities may represent very real job requirements. As such, they **do need to be included**. Arguing against inclusion, however, is the likelihood that there may be a great many different and often trivial tasks that could be stated.

Resolution of this issue can be achieved by stating fringe activities in general terms. Thus, activities which are central to the occupation should be stated with greater specificity than those that are on the fringe or periphery.

Instead of listing all the tasks of a peripheral function, the overall function can be stated as one general task. For instance, if a secretary is also qualified and serving as a notary public on occasion, "Serve as notary public" would be an acceptable overall statement. It would be unnecessary to list all tasks of notary publics. Such a general statement retains the general activity among the tasks of the occupation, permitting data to be gathered later to assess its significance. Should it later be found to be of importance for training, it may then be subjected to a more detailed analysis.

Operation of Equipment and Use of Job Aids

Training for an occupation is often concerned with the development of skills in equipment operation, tool use, and in other things that assist the worker in doing tasks more effectively and efficiently.

Job aids can consist of such items as special tools, charts, test instruments, checklists, reference guides, templates, procedural manuals, maps, forms, wiring diagrams, hand calculators, style guides, or other such devices and memory aids that support task performance. Their use, in and of itself, is not a task activity. While there may be an urge to state these as tasks (e.g., "Operate milling machine," "Use reference book or manuals"), it is more helpful to list them separately. Addition of the words, "operate" or "use" contributes nothing.

By this item listing, equipment and job aids can be included separately. Only those items should be included for which there is a potential need in describing the job or for training.

Incidentally, these item listings can be useful in the process of generating task statements, to stimulate the ability of workers to recall their job tasks. Facilitators can ask in what tasks each item is used.

Use of Technical Concepts and Techniques

As with equipment and job aids, training in some occupations traditionally has been concerned with the acquisition of technical knowledge rather than job performance. Key information or technical concepts that have practical use in performing job tasks may include vocabulary and nomenclature, machine characteristics and specifications, organizational or system structure, advanced computational techniques, operating principles and theories, rules and standards.

There can be strong pressure from DACUM panels to include technical concepts and techniques as task statements. Such might appear as follows:

- Use simple business math
- Perform analog programming
- Demonstrate sensitivity to worker grievances

While it is recognized that such technical knowledge may be of training significance, by themselves **they are not purposeful tasks of the job**. They are the means by which one or more tasks are accomplished.

Describing Supervisory and Managerial Jobs

One of the most challenging efforts is to state the tasks performed by supervisory and managerial personnel. It is insufficient to say that they "Supervise subordinate personnel," "Control flow of work," "Monitor safety programs," "Supervise training program," "Analyze company operations," "Plan facility modifications," or "Attend meetings."

Several tasks need to be identified to describe what is being done in accomplishing each such general function. Thus, instead of "Hire new employees," it may be more appropriate to identify such component tasks as:

- Process applications for employment
- Screen applicants based on standard test scores
- Interview applicants
- Orient new employees to the firm

Supervisory and managerial jobs, as well as those of professional occupations, often involve tasks that are more mental than physical in nature. Such tasks will reflect actions such as:

Appraise
Approve
Compare
Conduct
Coordinate
Counsel
Explain
Inform
Plan
Review
Schedule
Verify

These reflect an emphasis upon information processing and communication functions, which are common features of many jobs not dealing with equipment operation or maintenance, or with direct service for a customer or client. It should be obvious from a number of these actions that **tasks need not be limited to observable work performance**, but often may identify job activities not readily discernible by a person other than the worker.

Appendix C

DACUM and CBE Terminology

APPENDIX C

DACUM AND CBE TERMINOLOGY

Activity--A series of one or more actions necessary to complete a task. Also commonly referred to as steps or elements.

Common-core competencies--A group of competencies required by many jobs within an occupational cluster.

Competence--Achievement of the knowledge, skills, and attitudes required by a worker in order to perform a given occupational task.

Competency--A description of the ability one possesses when they are able to perform a given occupational task effectively and efficiently.

Competency-Based Education (CBE)-- An instructional program that derives its content from verified tasks and bases assessment on student performance. The tasks (competencies) the student is to learn and perform in these programs are based on tasks which are carefully identified and verified in advance of instruction. The criteria by which the student will be evaluated, and the conditions under which evaluation will occur are also specified. Instruction emphasizes the ability to DO as well as knowing the how, and why. Student performance and knowledge are evaluated individually against stated criteria, rather than against group norms. Programs of this type are also sometimes called **performance-based education (PBE)** and **performance-based training (PBT)**.

Competency Profile--A graphic portrayal of all the duties and associated task statements important to workers in a given occupation. Also used are the terms **task list, occupational profile, and DACUM Research Chart.**

Coordinator--The person in some companies and agencies who plans the DACUM occupational analysis process, makes the necessary pre-workshop arrangements--including the selection of the committee occupational experts--and provides for post-workshop activities such as verification of the task statements.

Criterion-Referenced Measure--An instrument composed of items (criteria), established in advance of instruction, that are used for assessing the students' development of knowledge, skills, and/or attitudes as stated in the performance objective. The criteria are based on occupational standards and do not involve comparing the performance of one student against the performance of other students.

Curriculum--A description or compilation of statements about "what is to be learned" by students in a particular instructional program; a product that states the "intended learning outcomes" that have been selected and ordered.

DACUM--An acronym for Developing A Curriculum. It is an approach to job, occupational, process, and functional analysis that involves bringing a committee of expert workers together under the leadership of a trained facilitator. Modified brainstorming techniques are used to specify in detail the duties and tasks that successful workers in their occupation must perform. The general knowledge and skills needed, important worker behaviors, tools and equipment, and future trends and concerns are also identified. The Center also defines DACUM as including the task verification and task analysis components of the **analysis** phase of curriculum development.

DACUM Research Chart--This is the name given to all DACUM charts developed by the Center on Education and Training for Employment at Ohio State University. Each chart contains a graphic portrayal of the duties and tasks identified, plus the four descriptive lists of: 1) general knowledge and skills, 2) worker behaviors, 3) tools, equipment, supplies, and materials, and 4) future job trends/concerns.

DACUM Research Chart Bank--This is a listing of over 300 DACUM Research Charts produced by Center personnel or Center trained facilitators. They are available for purchase at the: Center on Education and Training for Employment, 1900 Kenny Road, Columbus, OH 43210.

DEX--the DACUM Exchange also collects and distributes DACUM charts. It is housed at Humber College, 205 Humber College Blvd., Rexdale, Ontario, Canada M9W5L7.

Duty--A cluster of related tasks from a broad work area or general area of responsibility (area of competence).

Educational (Training) Program--The complete curriculum and instruction (**what** and **how**) that is designed to prepare a person or group of persons for employment in jobs or other performance situations.

Enabling Objective--A process-type objective that helps students progress toward achievement of a performance objective.

Facilitator--The person who leads the DACUM occupational analysis workshop to identify the actual job duties and tasks, and related information.

Feedback--A learning activity in which the learner is provided with information about his/her progress through model answers, model critiques, product/performance checklists, or other means.

Functional Analysis--Similar to occupational analysis and used to determine the duties and tasks performed by workers assigned to more than one area of job responsibility. For example, in state employment service agencies, workers may be assigned to one or more of the following: orientation, intake, assessment, case management, employer services.

Individualized Instruction--An approach for managing the instructional process where the focus is on helping individual learners (as opposed to groups of learners) acquire the knowledge, skills, and attitudes needed. It is geared to the student's own needs, learning preferences, and rate of learning.

Information (instruction) Sheet--Segment of a learning package (module or learning guide) that is used to provide attitudinal and cognitive information to the learner.

Instruction--Whereas curriculum identifies the content or "what is to be learned," instruction is the process, the how, or the means by which the intended learning will be achieved.

Job--A specific position requiring the performance of specific duties and tasks--generally the same tasks are performed by all workers having the same title.

Job Analysis--Identification of the duties and tasks that comprise a single job like carpenter or plumber.

Learning Activities--The required and/or optional procedures that students complete when using a learning package. For instance, they may tell a student to view a videotape, complete an activity sheet, etc. They include information sheets, activity sheets, job sheets, self-checks, case studies and many other types of activities.

Learning Package--A generic term used to describe the many types of student learning materials used in most CBE/PBT programs. Two commonly used types are learning guides and modules.

- **Learning Guide**--A type of learning package that usually contains a performance objective, enabling objectives, a series of learning activities, a listing of the external supportive resources needed, and feedback activities. While learning guides are developed in a wide variety of formats, most are dependent upon external resources to provide most of the essential content needed.

- **Module**--A type of learning package that usually includes a performance objective, enabling objectives, essential attitudinal and cognitive information; planning or practice activities, and feedback activities. While modules are developed in a wide variety of formats, most are self-contained, transportable, and designed for either individual or group use.

Occupation--A work area that consists of two or more related jobs or levels. For example, in apprenticeable fields, the entry level worker may be an apprentice, followed by a journeyman, and a master craftsman. There is always some commonality to the tasks performed.

Occupational Analysis--A process to identify the duties and tasks that are important to workers in any given occupation. A number of alternative approaches to occupational analysis are available. Also sometimes is called **job analysis.**

Occupational Cluster--A grouping of jobs that are related by the similarity of the tasks performed by the various workers.

Open-Entry/Open-Exit--Open-entry/open-exit enrollment is an administrative device designed to make competency-based and individualized instruction more feasible and useful. It allows the trainee to: 1) enter the vocational program at virtually any time an appropriate work station is available, and 2) exit the program without penalty whenever the specified competencies or tasks have been achieved, or when an alternative decision has been made. Thus, trainees are not enrolled or discharged on only a few dates in the year, neither are they arbitrarily required to remain enrolled in a program for stipulated number of weeks, months, or years.

Performance-Based Training (PBT)--A term that means the same as CBE but is often preferred by industry.

Performance Checklist--A list of specific criteria, usually based on actual occupational standards, that is used to evaluate the process used and/or product developed by a worker when performing an occupational task. These checklists should also include worker behaviors and performance time criteria when appropriate.

Performance Standard--Criteria which the trainee/worker must meet when performing a task.

Process Analysis--Similar to an occupational analysis, this involves identifying the duties and tasks performed by a small group or team of workers with a common job assignment but with different job titles and responsibilities. For example, a manager, engineers, technicians, and skilled workers may all be assigned to a single common process. This type analysis is used by many companies to help meet ISO 9000 and QS 9000 standards.

Resource Person--The professional educator who is directly responsible for guiding trainees and helping them plan and carry out their professional development programs.

Resources--Materials from whom a student gains skills, knowledge, and attitudes necessary for performing job tasks. They may include print and audiovisual materials of all kinds, equipment used in the occupation, computers, simulators, peers, instructors, individuals from the field or community, internships, group discussions, and lectures.

Skill--The ability to perform occupational tasks with a degree of proficiency within a given occupation. Skill is conceived of as a composite of three completely interdependent components: cognitive, affective, and psychomotor behavior. Skills tend to support the performance of many tasks.

Step--One of a series of procedures or activities that a worker does to complete a task. The completion of steps alone do not result in a meaningful unit of work.

Task--A work activity that is discrete, observable, performed within a limited period of time, and that leads to a product, service or decision. Tasks are also frequently referred to as the competencies that students or trainees must obtain in order to be successful workers.

Task Analysis--The process of analyzing each task to determine the steps involved, performance standards, tools, and equipment needed, related knowledge, safety, attitudes, and decisions expected of workers performing it.

Task List--A list of the duties and tasks performed by workers in a given occupation, usually verified (validated) by workers and/or immediate supervisors.

Task Statement--A description of a meaningful unit of work that contains an action verb, an object that receives the action, and usually one or more qualifiers, and represents a typical job assignment that an employer or customer would pay for.

Verification--The process of having experts review and confirm or refute the importance of the task (competency) statements identified through occupational analysis. Other questions such as the degree of task learning difficulty are also frequently asked. Reviewers are usually selected form the ranks of practicing workers and immediate supervisors of such workers. This process is also sometimes referred to as **validation.**

Appendix D

CBE: AN EFFECTIVE AND REALISTIC APPROACH TO EDUCATION AND TRAINING

APPENDIX D

CBE: AN EFFECTIVE AND REALISTIC APPROACH TO EDUCATION AND TRAINING

by Robert E. Norton

Traditionally, in education and training, we have accepted the option of making **learning** the variable and **time** the constant. Whenever we say that a course involves so many hours of instruction, we are openly admitting our acceptance of this historical and ineffective approach. A set number of hours per course is admittedly an administrative and planning convenience that is hard to give up. However, under these circumstances, our teaching is often geared to covering as much information as possible in the time permitted, in hopes that enough will be learned to allow our students/trainees to be successful.

Many persons feel it is time that those of us involved in training and education should be opting to implement programs in which learning is the constant and time the variable. Vocational educators in many states, including New York, Kentucky, Florida, North Carolina, Ohio, Texas, Wisconsin, and Pennsylvania, are currently working hard to make this option a reality in their vocational and technical education programs through the implementation of competency-based education (CBE).

Business and industry trainers far more commonly refer to their PBE (performance-based education) or PBI (performance-based instruction) programs. Many, many companies including Motorola, Dofasco, AT&T, Ericsson, General Motors, and United Airlines want programs that will prepare employees to **perform** at high levels of quality and efficiency.

Before proceeding, it should be noted that terms and acronyms for these programs abound: CBE, PBE, PBI, CBI. What is important is that **all** such programs, regardless of the specific names attached to them, should possess the essential and desirable characteristics described below in order to be considered truly competency- or performance-based.

To understand fully the meaning of CBE, one must be aware of the essential elements and desirable characteristics of such programs.[1] There are five essential elements:

1. **Competencies to be achieved are carefully identified, verified, and made public in advance**--This simply means that the important entry-level competencies for any

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[1] The essential elements and desirable characteristics presented here are adapted from **Achieving the Potential of Performance-Based Teacher Education: Recommendations**, PBTE Monograph Series: No. 16 (Washington, DC: American Association of Colleges for Teacher Education, 1974).

occupational program area must be identified in some appropriate manner, verified as relevant by experts who know that field, and then made known to students, trainees, and everyone else interested in what the program is designed to teach.

2. **Criteria to be used in assessing achievement and the conditions under which achievement will be assessed are explicitly stated and made public in advance**--This means we are going to eliminate guessing games about what parts of the course are important and tell students/trainees exactly how their performance will be evaluated. The implementation of this essential element also means that we are giving up the traditional norm-referenced approach to the evaluation of student achievement in which the focus is on comparing a learner's progress with that of other learners. In its place, we are adopting the criterion-referenced approach in which each individual learner's progress is compared with previously established criteria that are made known to all who are concerned.

3. **The instructional program provides for the individual development and evaluation of each of the competencies specified**--What we are saying here is simply that each learner shall be given the opportunity to develop each of the competencies important to his/her training program, and that each learner will be given the opportunity to demonstrate attainment of each competency. This essential element has strong implications regarding the need to individualize CBE programs to the maximum extent possible and for the type of instructional materials needed to make individualization possible.

4. **Assessment of competency takes the learners' knowledge and attitudes into account but requires actual performance of the competency as the primary source of evidence**--CBE goes beyond the traditional educational expectations that learners should **know** the "how" and "why" of things and places a strong emphasis on the "ability to do" as well. Of course, in order to perform a task correctly, the student/trainee will need to acquire the necessary prerequisite knowledge and attitudes. Acquiring the necessary prerequisite knowledge and attitudes involved, however, does not by itself ensure the learner's actual ability to perform important competencies. It is with regard to this essential element of CBE that many programs fall short, relying instead only upon paper-and-pencil tests of cognitive understanding as proof of competency. While such measures can appropriately be used to assess prerequisite knowledge, they must be supplemented by performance-oriented, process, product, and attitudinal checklists or other measurement devices that permit assessment of the learner's actual ability to perform the expected competencies.

5. **Students/trainees progress through the instructional program at their own rate by demonstrating the attainment of specified competencies**--Said another way, time is the variable and learning the constant. Again, it is clear that some individualization of instruction is called for. While student progress is dependent upon the demonstration of competencies, this element does not mean that reasonable time limits cannot be imposed upon the learners. Some persons may

want to interpret this element to mean that only the student is accountable for his/her progress. Not so--a CBE program places accountability for learning squarely upon the shoulders of both the learner and the instructor.

The additional **desirable characteristics** of CBE programs are as follows:

1. Instruction is individualized to the maximum extent possible, rather than group-paced.
2. Learning experiences are guided by frequent feedback.
3. Emphasis is on helping the learner achieve program exit requirements.
4. Instruction is individually paced rather than time-based.
5. Instruction is, to a considerable extent, field-centered--based on realistic work problems and situations.
6. Instruction is often modularized and uses materials with both required and optional learning activities to help achieve flexibility and provide for different learning styles.
7. The program as a whole is carefully planned and systematic (e.g., concerned staff are involved in planning, and evaluation data is used for program improvement).

To help the reader visualize some of the major differences between a CBE program and a conventional program of education and training, twelve factors related to each of the programs are presented below. Admittedly, few of today's programs would meet exactly the criteria for either type of program. While most actual programs are probably located somewhere between the two extremes, the comparison helps to summarize some of the basic differences inherent in the two approaches.

	Conventional Vocational Programs	**Competency-Based Vocational Programs**
1.	Content-Based	Competency-Based
2.	Time-Based	Performance-Based
3.	Group Paced	Individually Paced
4.	Group Needs	Individual Needs
5.	Delayed Feedback	Immediate Feedback
6.	Textbook/Workbook Materials	Modules and Media Materials
7.	Limited Field Experience	Learning in the Field
8.	Lectures, Demonstrations	Assistance of Resource Person
9.	General Objectives	Specific Objectives
10.	Subjective Criteria	Objective Criteria
11.	Norm-Referenced	Criterion-Referenced
12.	Final Grades	Learner Competence

Whether you are implementing your own CBE program, helping another teacher or instructor implement such a program, or in the position of evaluating programs implemented by others, some means of formative evaluation can be very helpful. With the essential elements and the desirable characteristics in mind, a Competency-Based Education Program Evaluation Checklist (see figure 1) has been devised to help you assess the status of any CBE program. It is recognized that different states, school systems, and companies have somewhat differing philosophies about what CBE is and, hence, the checklist may have to be modified to fit local philosophies. Nevertheless, it is felt that the criteria listed reflect the minimum essential program elements that are generally recognized as necessary to assure overall program quality. It is hoped that the instrument can be used in a positive way to promote further the implementation of high-quality CBE programs that will better meet the education and training needs of our youth and adults.

LEARNING GUIDE: PERFORMANCE TEST

STUDENT'S NAME	DATE

COMPETENCY: Mow the Lawn	TEST ATTEMPT 1st 2nd 3rd

DIRECTIONS:	OVERALL EVALUATION	
	Level Achieved	PERFORMANCE LEVELS
Given a lawn mower and a lawn needing mowing, mow the lawn. Your instructor will use the criteria listed below to determine whether you are competent in this task.		4 Can perform this skill without supervision and with initiative and adaptability to problem situations.
		3 Can perform this skill satisfactorily without assistance or supervision.
		2 Can perform this skill satisfactorily, but requires some assistance and/or supervision.
		1 Can perform parts of this skill satisfactorily, but requires considerable assistance and/or supervision.

PERFORMANCE STANDARDS For acceptable achievement, all criteria should receive a "yes" or "N/A" response.	Yes	No	Not Appl.
1. Greeted customer politely			
2. Added correct amount of oil, if needed.			
3. Filled gas tank, if needed.			
4. Adjusted mower to desired cutting height, if needed			
5. Attached bagger, if desired			
6. Started engine safely by:			
a. mower was on flat ground.			
b. all objects were kept clear			
c. cranked engine at correct speed			
d. wore safe clothing/shoes.			
e. adjusted throttle/choke for smooth operation.			
7. Mowed lawn in pattern requested			
8. Mowed all of the lawn			
9. Operated mower safely by:			
a. removed objects from lawn			
b. kept children and animals a safe distance			
c. mowed lawn at safe speed.			
10. Disposed of clippings as requested.			
11. Collected reasonable fee, if appropriate.			
12. Completed mowing in reasonable time			
13. Prepared mower for storage.			
14. Returned mower to storage			
15. Thanked customer.			

Fig. 1 Sample learning guide performance test

Program ____________________

Name ____________________

Date ____________________

Directions: Indicate the extent to which the program being evaluated has implemented each of the following essential elements and desirable characteristics by checking the appropriate box under Level of Implementation.

	Level of Implementation			
	Poor	**Fair**	**Good**	**Excellent**
A. ESSENTIAL CHARACTERISTICS				
1. Competencies to be achieved have been:				
a. carefully identified	☐	☐	☐	☐
b. verified by local experts	☐	☐	☐	☐
c. made public	☐	☐	☐	☐
2. Criteria for assessing each of the verified competencies have been:				
a. derived from analysis of the competencies	☐	☐	☐	☐
b. explicitly stated along with conditions	☐	☐	☐	☐
c. made public	☐	☐	☐	☐
3. Instructional program provides for the:				
a. individual development of each competency	☐	☐	☐	☐
b. individual assessment of each competency	☐	☐	☐	☐
4. Assessment of the students' competency:				
a. takes knowledge into account	☐	☐	☐	☐
b. takes attitudes into account	☐	☐	☐	☐
c. requires actual performance of the competency as the major source of evidence.	☐	☐	☐	☐
5. Students progress through the program:				
a. at their own rate	☐	☐	☐	☐
b. by demonstrating their competence	☐	☐	☐	☐
B. DESIRABLE CHARACTERISTICS				
6. Instruction is individualized to the maximum extent possible.	☐	☐	☐	☐
7. Learning experiences are guided by frequent feedback.	☐	☐	☐	☐
8. Emphasis is upon students' achievement of exit requirements.	☐	☐	☐	☐
9. Instruction is individually paced rather than time-based.	☐	☐	☐	☐
10. Instruction is field-centered using realistic work situations and actual on-the-job experiences.	☐	☐	☐	☐
11. Instructional materials are:				
a. modularized	☐	☐	☐	☐
b. mediated	☐	☐	☐	☐
c. flexible with both required and optional learning activities provided	☐	☐	☐	☐
12. The instructional program as a whole is carefully planned and systematic--evaluation data is used for program improvement	☐	☐	☐	☐

Level of Implementation: In a fully implemented CBE program, all items will receive an excellent response. If any item receives a Poor or Fair response, you should meet with your competency-based education program coordinator to determine what changes are needed and how you can get help in making them.

Fig. 2 Competency-based education program evaluation checklist.

Appendix E

Brief History of DACUM

APPENDIX E

BRIEF HISTORY OF DACUM

A. Clinton, Iowa Job Corps

In 1966, DACUM (Developing A Curriculum), was a new approach to the development of curricula that was combined with a new evaluation process for occupational training programs. It was created initially in a joint effort by the Experimental Projects Branch, Canada Department of Manpower and Immigration, and General Learning Corporation of New York, which provided technical direction to the Women's Job Corps program at Clinton, Iowa. Early efforts at Clinton were intended to produce a curriculum guide that would enhance trainee involvement in the training program and in planning for goal attainment. The result was a graphic presentation of the curriculum similar to a time bar chart. Following these early efforts, an experimental DACUM for a typical occupation was developed in Canada as a model for further application. It was introduced to the NewStart Corporations in 1968 during their planning stages.

The idea was adopted by Nova Scotia NewStart Inc. because of a number of circumstances that demanded a new approach to curriculum development. Because of the nature of the NewStart assignment, it was necessary to respond quickly to the needs of disadvantaged adults. This, in turn, created a need for immediate action in planning any training program and defining it in curricular form.[1]

B. Holland College, Charlottetown, P.E.I.,Canada

DACUM was adopted by Holland College in 1969 through the efforts of President Donald Glendenning and program development specialist, Larry Coffin. DACUM is used as the basis for developing all of their educational programs. DACUM has also been widely used by many other postsecondary colleges throughout Canada such as Humber College of Applied Arts and Technology in Toronto, where a DACUM chart exchange service has been established.

C. National Center for Research in Vocational Education

Robert E. Norton and James B. Hamilton learned of the DACUM procedure from Larry Coffin in May 1975, during a performance-based teacher education (PBTE) resource person's training workshop at Holland College.

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[1] Taken from R.E. Adams, DACUM: **Approaches to Curriculum Learning and Evaluation in Occupational Training**, Ottawa, Canada, 1975, p. 23.

In January 1976, Robert E. Norton employed Larry Coffin to facilitate the first DACUM conducted at the National Center. An analysis of the job of local vocational education administrator was conducted at that workshop.

In December 1976, Norton conducted a DACUM workshop on the job of legal assistant for the Colorado Instructional Materials Service at Colorado State University, Fort Collins. Later, Wiley B. Lewis and Phyliss J. Abt conducted many additional DACUM occupational analyses for the Colorado State Department of Education. In October 1977, Norton facilitated an analysis of the job of vocational teacher implementing competency-based education at the National Center.

In February 1978, the DACUM process was explained and promoted by Norton as an alternative approach to occupational analysis at two national USOE-EPDA funded workshops on (1) the implementation of competency-based administrator education (CBAE) programs and (2) the implementation of competency-based staff development (CBSD) programs.

In April 1978, Dean Don Altieri of Caldwell Community College and Technical Institute (Hudson, North Carolina) employed Robert E. Norton to conduct an analysis of the job of radiologic technologist. That was followed soon after by his conducting an analysis of the job of instructional specialist for the ACCTion Consortium at Tri-County Technical College (Pendleton, South Carolina) in August 1978.

In 1979, a number of requests for DACUM workshops were received and analyses conducted at various community colleges and at the National Center by Audni Miller-Beach, James B. Hamilton, Robert E. Norton, Karen Quinn, and a few other staff members. A few non-National Center persons, most of whom went to Holland College for training, also started conducting DACUM workshops.

In March 1982, Robert E. Norton was employed by Trident Technical College (Charleston, South Carolina) to both conduct an analysis of the job of industrial mechanic and train three DACUM facilitators for the college. An unpublished DACUM facilitator's handbook was assembled for that workshop.

The National Academy, under the leadership of Mark Newton and Audni Miller-Beach, arranged for a DACUM workshop on the DACUM Facilitator's job to be conducted at the National Center in October 1982. It was that occupational analysis that provided the research base for development of the first **DACUM Handbook** and guidelines for the development of a formalized DACUM facilitator training program.

In January 1983, Robert E. Norton trained and assisted persons in Venezuela to conduct a DACUM analysis of the job of vocational superintendent at Maracay. During the same week, James B. Hamilton facilitated a DACUM workshop on the instructor's job at Maracay. In November 1983, he also conducted an orientation program and demonstration DACUM in Jakarta, Indonesia for the Asia-Pacific regional office of the International Labor Organization ILO/APSDEP. Twenty-five persons from eleven countries participated in the analysis of the job of vocational instructor/trainer.

In January 1984, Audni Miller-Beach, James B. Hamilton, and Robert E. Norton planned and conducted a formal DACUM training program to prepare other National Center staff to assume some of the responsibility for facilitating DACUM workshops. In July 1984, the National Center conducted its first official DACUM Training Institute for twelve carefully selected candidates from the United States, Canada, and Pakistan.

The second DACUM Training Institute was conducted at Caldwell Community College and Technical Institute in Hudson, North Carolina in October 1984 and the third DACUM Training Institute was conducted in March 1985 at Brookhaven College, a member of the Dallas County Community College District.

D. Other Major Users in the United States

Perhaps the major user since 1976, outside of the Center on Education and Training for Employment (CETE), whose staff have conservatively conducted over 500 DACUM workshops since 1976, is the Curriculum Materials Service at Colorado State University at Fort Collins, where Wiley Lewis and others have conducted over 50 workshops. Other early users and promoters included Tim Nolan for the AACTion Consortium at Tri-County Technical College, Pendleton, South Carolina; Jack Harris of Stark Technical Institute, Canton, Ohio; Ken Kyre of the State Board for Technical and Comprehensive Education, Columbia, South Carolina; Betty Howe, Director of Instructional Development for Trident Technical College, Charleston, South Carolina; Don Altieri, Dean of Caldwell Community College and Technical Institute, Hudson, North Carolina; Laura Capp, CBE Curriculum Coordinator at Seminole Community College, Sanford, Florida; and Marilyn Peterson, Educational Development Officer at Durham Technical Institute, Durham, North Carolina.

In the mid-1980's, the East Central Network for Curriculum Coordination at Springfield, Illinois, also began to use and advocate the DACUM process. In the late 1980's, Dave Flumbaum, Dennis Faber, and others at Dundalk Community College, Baltimore, Maryland, became major users of the process and have trained many persons from Maryland and neighboring states. The National Occupational Competency Testing Institute (NOCTI) of Big Rapids, Michigan, has extensively used the DACUM process to provide a solid foundation for their test development efforts.

E. Center on Education and Training for Employment

Robert E. Norton, DACUM Program Director at CETE, has promoted and conducted DACUM Training Institutes and workshops nationally and internationally for many, many companies, schools, colleges, universities, and state and federal government agencies. He and CETE are now conducting on the average of over one institute per month. Some of these are requested and hosted specifically by one company or agency, while others are sponsored and hosted by CETE or a cooperating agency.

The demand for high-quality DACUM training and certification continues to grow as companies become more aware of the benefits it offers. Demand for training by school to work and tech prep personnel who want to connect their schools and colleges more closely with business and industry is also increasing. And, the strong demand by international educators and trainers is on the rise as those persons learn how their United States counterparts and competitors are using the process to improve training, etc.

A table exhibiting the Center's international DACUM clients follows. Transparencies contained in Appendix A display the names of many of the major companies, universities, and countries worked with.

Our records indicate to date that the Center has conducted 88 DACUM Training Institutes during which over 1,000 persons from 27 countries have been trained. It needs to be acknowledged that many others have helped Center staff with this training effort. At the Center, Robert E. Norton and Scot Krause have been the primary participants. Serving as valuable consultants have been James B. Hamilton, Aaron J. Miller, John Hart, Janie Thomas, Julie Bellamy, Krystana McLennon, Charlotte Morris, Le Duckworth, and Allen Wiant.

Outline of Experiences Conducting DACUM Internationally

Conducted in Sponsoring Country

Country	Year(s)	Nature of Analysis	Language	Jobs
Indonesia	1983	ILO/ASOEP	English	Instructor/Trainer
Venezuela	1983 1993	Government Sponsored	Bilingual, Spanish	Vocational Administrators Trainers (BIL)
New Zealand	1992	Ivergille Technical College	English (British)	Various
Philippines	1987 1993	Government Sponsored	Bilingual	7 different ones
Sri Lanka	1993	Government Sponsored	Bilingual Surinese	3 varied
Mauritius	1994	Government Sponsored	English (British)	3 varied
Krygyzstan	1993	Government Sponsored	Bilingual Russian	Sheep Farmer
Canada	1992 1994	Niagara College, Ontario Niagara College, Ontario	English	Various
Sweden	1995	Ericsson Sponsored	English (British)	Various
Turkiye	1996	ATHB/BIBB World Bank	Bilingual Turkish	Various

Conducted in the United States

Country	Year(s)	Nature of Analysis	Language	Jobs
Singapore	1985, 1987, 1989	Government (IVTB)	English	Various
Kuwait	1990	Government Authority	English	Various
Dominican Republic	1989	Government Sponsored	Bilingual Spanish	Various
Chileans	1990	USAID	Bilingual Spanish	Director of Vocational Technical Education
Chinese	1993	State Education Commission of China	English	Vocational Teacher

Country	Year(s)	Nature of Analysis	Language	Jobs
Malaysians	1995	Government Ministry	English	Curriculum Developer, Vocational Trainer
Turkey	1994 1996	Turkish Government	English	Vocational-Technical Teacher Educator
Krygyzstan	1995	World Bank	Bilingual Russian	Curriculum Developer

CETE Takes DACUM International

COUNTRIES WHERE TRAINING HAS BEEN PROVIDED:	COUNTRIES FROM WHICH TRAINEES HAVE COME TO USA:
Canada Indonesia Singapore Philippines New Zealand Sri Lanka Venezuela Australia Kyrgyzstan Mauritius Sweden Turkey	Canada Singapore New Zealand Australia Malaysia Chile China Korea-South Santa Domininca Kuwait Fiji Saudi Arabia Netherlands Tunisia Turkey Kyrgyzstan Israel

Appendix F

Potential Problems in Working with DACUM Committees

Potential Problems in Working with DACUM Committees*

Problems in Working with Committees

The suggested techniques for organizing committees and conducting workshops to develop DACUM charts are stated in terms of the duties and tasks of the facilitator and the demands that must be placed on the committee in order to achieve quality. Nevertheless, there are a number of situations that can and will interfere with the DACUM process and chart development. The following are problems that have been encountered. The facilitator should be aware of these so that the suggested corrective actions can be taken to maintain committee focus and better assure the quality of the final analysis.

1. Committee Too Small

A committee of three or four persons presents special problems. Normally members serve as a sounding board for the facilitator, helping determine if contributions are accurate and applicable in the wide range of activities in the occupation. If the committee is too small, the facilitator has less opportunity to verify accuracy. Often, there is a tendency for one person to dominate. It is easier for one person to engineer a role in which he/she makes most of the contributions and casts the others in a supporting, confirming role. Second, small committees selected on a regional or local basis tend to focus their contributions on only their companies' needs even though the analysis calls for wider coverage. Finally, small committees tend to focus on a particular area or specialty and may lack the ability and expertise needed to explore diverse activities or specialties in the occupation.

The facilitator must consistently steer discussion away from the single person, the local community, or the single specialty in the occupation. He/she may have to ignore the dominant person at times and solicit contributions from the others, casting the dominant person in the role of confirming other contributions. When a small committee becomes too localized or begins to focus on a familiar specialty, the facilitator should periodically halt proceedings for a review, pointing out the previously established boundaries and range of application of the occupation. It is also useful to solicit confirmation from committee members that they have adequate knowledge of or prior experiences in the applications they are tending to de-emphasize. In other words, it may be necessary to reconfirm for them that they are indeed capable of handling the entire scope of the analysis. The facilitator can broaden the coverage of the analysis by consistently asking the committee if each definition would apply in and is adequately stated for specific regions or firms he/she might designate.

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* Adopted from ***DACUM: Approach to Curriculum, Learning, and Evaluation in Occupational Training*** by Robert E. Adams, Department of Regional Economic Expansion, Ottawa, Canada: Revised 1975, pp. 107-118.

2. Committee Too Large

In cases where committees are very large (15 or more) problems of a different sort appear. A number of committee members make relatively few contributions unless a definite plan is made to stimulate the contribution of each. Overt efforts to do this, however, might dampen the enthusiasm of more vocal committee members who obviously are ready to specify tasks they know must appear on the chart.

In some cases the large committees will consist of a number of members who are content to sit back and allow a more vocal group to provide most of the contributions. In the interest of completing the analysis, the facilitator may allow this to continue throughout the workshop. However, he/she must take steps to ensure that it does not become a problem. The facilitator can periodically ask specific members who are less vocal to describe applications of skills in their own firms or specialties. This gets them participating and gives them an opportunity to describe differences and to help specify the tasks more accurately. In reality, they are beginning to contribute task definitions of their own, which in turn generates enthusiasm for becoming a part of the task specification process.

The facilitator can also involve the less vocal committee members when the prime contributors run into difficulty over wording and, more importantly, during the final stages of the analysis in order to ensure the task definition is suitable for their own and other environments.

3. Disadvantageous Seating Arrangements

Seating must be arranged so all persons can see the wall surface and read the definitions. For committees of 5-12 persons the arrangement will usually be having a row of tables and chairs facing the wall. The tables should be placed 8 to 15 feet from the wall in a half-circle pattern.

4. Late Arrivals for Orientation

Orientation provides the framework for the workshop, and it is important that all persons be present when it begins. Some persons attend meetings only to present a point of view. They do not intend to participate full time. Others arrive late due to unavoidable circumstances.

It has been found useful to orient these persons immediately and separately from the group. This may be done by stopping for a coffee break. In some committee work, the presence of a second facilitator has enabled one to leave the workshop, orient the new arrival, and return with him/her to observe for a time and review work completed.

A late arrival can disrupt committee proceedings if he/she is not given an orientation prior to making contributions. If there is no opportunity to do this immediately on entry, it is best to ask the newcomer to refrain from contributing until he/she has been provided with appropriate orientation. The newcomer will learn a lot by observing and will not feel he/she has to begin debating issues at once.

5. Persons Who Treat the Workshop as Just Another Meeting

Occasionally, one encounters persons, particularly those who are in peripheral positions in the occupation, who attend a large number of meetings. They view curriculum and similar meetings as opportunities to renew old acquaintances, to discuss a variety of issues, and to raise special issues of their own.

It may be difficult to convince such a person that the workshop is an activity which demands that a lot of hard work be done in a short period of time and that he/she must quickly learn to work within the required framework if the job is to be done. It is best to take such a person aside at the first opportunity, such as a coffee break, to discuss the issues with him/her and to encourage the person to take a more objective view in working as part of the team.

6. Persons Concerned with the Prestige of the Occupation

One sometimes encounters an individual who is convinced that the prestige of the occupation will be enhanced by the prestige of the training program. This type person may be unwilling to allow an activity of this sort to clarify exactly what the occupation is about lest this expose its true nature. He/she will talk around issues and attempt to inflate them rather than share in the process of specifying a number of easy-to-define tasks. A committee can work quite rapidly in specifying the more manipulative, procedural tasks of the occupation, but this individual will try to involve the committee in discussing related issues such as philosophy of the occupation, the long-range future, and the effects of changing technology.

There are several techniques which the facilitator can apply to overcome this kind of resistance.

(a) You can ignore the individual's comments and use others in the committee for contributions to the specific area or band in the chart that is being analyzed. While this person will resist and attempt to make some contributions, the facilitator should downplay these and allow the rest of the committee to contribute their specifications. The member may react by falling silent and may subsequently begin to participate as part of a committee. If the individual reacts by becoming even more vocal, the other members can usually be relied on to take action to reduce his/her interference.

(b) You can take the individual aside in the desired manner, to re-explain the nature of the exercise and even suggest that he/she consider leaving the workshop if he/she cannot participate appropriately.

(c) Occasionally such a person will insist that there are really only one or two tasks in an area being analyzed or that the area is not significant or worthy of this kind of analysis. A useful technique is to proceed over these objections and assist the others in defining a number of tasks in that area. This will expose the unreasonable person's attitude and arguments to the rest of the committee. In short, this is a definite move to help the rest of the committee, with their occupational expertise, control a situation the facilitator cannot control.

7. Persons Concerned with Training for Purposes of Prestige

Some persons feel that if the chart reflects sophisticated theories and principles from a variety of fields, it will make the graduate appear more sophisticated and thus enhance the prestige of the occupation. These persons are sometimes difficult to detect and subsequently handle because the facilitator is never sure whether specific information and tasks are required until he/she can generate enough debate. Sometimes a person so concerned will influence the remainder of the committee to specify unnecessary content. The facilitator must be alert to the fact that they may be being influenced by someone or something other than their professional judgment. In addition to the techniques recommended in (6), the facilitator can refer the committee to other workshops where this tendency was present, describe the subsequent difficulties it caused, and suggest that this committee would not wish to dissipate effort in this way. Most members will jump at the opportunity to reject the influence of the person who initiated the problem.

8. Persons Concerned with Knowledge for the Sake of Knowledge

Persons who feel strongly about the dominant place of knowledge in training systems tend to emanate from three sources:

(a) There are persons in evolving occupations which have been ill-specified in terms of task requirements. This is particularly noticeable in occupations that are evolving from several other occupations. There is a tendency to guess at what knowledge is required for application in several areas of expertise and assume this will enable the graduate to function at once in a new occupational role.

(b) There are persons in occupations which have traditionally provided on-the-job training with knowledge being provided on a release basis as an external activity at a technical institute or trade school. They see training as that portion of the individual's development that occurs in the external institution. They have difficulty in specifying what the individual does on the job and what competence must be acquired there.

(c) There are persons in nonprofessional occupations which operate under strong professional direction or control. The professional, because his own training was highly knowledge-oriented, is usually not accustomed to specifying tasks in the way that is required and may tend to resist doing this, feeling that knowledge in itself is more important.

Sometimes there is a strong feeling that a wide background of information and theory is essential to enable the employee to speak intelligently about his/her field, as well as to perform capably, in order to be a credit to the occupation. In such cases it is useful for the facilitator to draw on examples which detract from this feeling. It is easy to point to occupations such as nursing or teaching in which increasing emphasis was placed on knowledge to the exclusion of useful occupational tasks. This is one place in which it may be necessary to stop and debate some of the issues before proceeding. Persons who feel strongly about this issue will resist committee activities until such debate takes place.

9. People Who Believe that Knowledge Leads Directly to Performance

Self-trained persons who read extensively in order to keep informed in their field sometimes have difficulty in isolating and specifying tasks. They attribute their own success primarily to the fact that they accumulated a good deal of knowledge, which, to them, is important. Consequently they prefer to specify competence by defining the elements of knowledge which they feel contribute to the competence.

Such persons are generally more difficult to work with than formally trained committee members, whose contributions are typically more precise. The facilitator must apply extra effort in assisting such persons to convert their ideas and contributions into task definitions. Their input is, nevertheless, important for they generally have a wide background that can be capitalized on to improve the coverage of the chart.

10. Persons Concerned with Problem-Solving, Analytical Thinking as the Prime Requisite

There are those who believe that the analytical problem-solving thought process is the most critical component of any training program. They refuse to participate in direct specification of activities, tasks, and skills in which the individual must apply knowledge, and they discourage the attempts of others to do this. The facilitator frequently must counteract this by downplaying the contributions of such persons and focusing attention on those who are contributing task definitions.

11. Persons Concerned with Attitudes as Opposed to Skills

Some committee members express more concern for desirable employee attitudes than for task specification. Such a person will argue that the problem in industry is attitudes and not task weakness, and he/she will attempt to divert discussion away from task definition and toward attitudes. This may be due to inability to specify tasks because of lack of detailed knowledge of the occupation. Or it may be due to emphasis in a current work role that is related to employee relations or over-all productivity and, consequently, to concern for work force attitudes.

The facilitator can apply three techniques to encourage such a person to function as a member of the committee. First, the committee member should be reminded that a list of worker behaviors (traits and attitudes) will be developed as a standard part of the DACUM occupational analysis process. Second, facilitator can ask the member to specify what he/she means by the attitude he/she is talking about and how it would be manifest in the work environment. Third, the facilitator can redescribe and expand on the rationale for first obtaining a comprehensive description of the tasks required. It is impossible to develop appropriate attitudes if there is not a suitable task or competency base on which to build.

12. Persons Concerned with the Technicalities of Correct Terminology

Occasionally one encounters an individual who is concerned with the status of the occupation and will insist that "correct" terminology be used in all applications. He/she may slow the pace of committee achievement as he/she will want to debate the adequacy of each task as it is specified, thus inhibiting the brainstorming process. This happens most frequently in workshops for occupations in which there is current debate between schools of thought.

The facilitator can readily resolve this problem by agreeing to use both of two suggested definitions. Frequently, all that is involved is a choice between two descriptive words. This can be settled by placing one of the words in parentheses behind the other to satisfy both proponents.

Another technique is for the facilitator to keep insisting that all editorial review be reserved for the latter portion of the workshop. The facilitator must emphasize that brainstorming must continue and that final editing will be done at an appropriate time in the development of the chart.

13. Persons with Narrow Learning Experiences

Some occupations have a history of standardized training to which most who have achieved occupational competence have been subjected. This might be a block release information theory training program, apprenticeship training. or employment in a series of sub-jobs until the learner has adequately performed in each and is allowed finally to perform the real tasks of the occupation. In such cases, committee members will frequently question the wisdom of changing this pattern. They come up with such arguments as "There are intrinsic benefits for persons who have to learn in this way," "It's good discipline," "It will make a better person out of him/her."

Such situations demand frequent review of the DACUM principles. The facilitator must go beyond the initial brief orientation and draw on rationale that supports the use of this procedure. It is also necessary for the facilitator to assure committee members that the DACUM system contains similar learning experiences and that the learner is soon going to have to demonstrate his/her perseverance in achieving, in completing tasks, and in furthering himself/herself in the occupation.

Another person of this sort is the professional who believes all learning takes place through books and lectures. He/she can frequently be encountered in looking at an occupation directly supporting a professional field. Books and lectures are mandatory for most professionals, and they feel that others should learn in the same way in order to be as adaptive and creative as they have been in their occupation.

14. Persons Who Believe There is Only One Way of Training for Their Field

One may occasionally encounter difficulty with an individual in an occupation with a long history of reasonably successful training. It is assumed that this is the optimum method of training for the occupation and that nothing should be allowed to change it. This sometimes becomes apparent during the restructuring of the chart in terms of establishing sequencing. If a particular sequence of tasks acquisition has been the accepted mode in the field for many years, the individual will want to see this pattern repeated, feeling that someone at some point in time did a careful analysis and discovered an optimum way for providing training. He/she sometimes fails to see that it may have been established by accident or through hasty decision-making which resulted in a standard pattern because the training institutions in that field wanted standardization and merely adopted the initial pattern. In such cases, the facilitator should halt proceedings, explore these issues, try to determine the origin of the pattern, and determine its suitability for application in the DACUM system.

15. The Person Who Rejects the DACUM Approach

Occasionally one runs into committee members who dislike the DACUM approach because of its permissiveness. They feel it is too liberal in allowing people to determine **what** they are going to learn. They suspect this may cause a breakdown of discipline considered necessary in the occupation.

These individuals are typical of persons who function in an authoritative or autocratic fashion in relation to the people they employ. They fear the development of a new breed of workers who are self-starting and self-thinking and who may take views quite opposed to conventional industrial relations practice. They can frequently be detected by such remarks as, "There is nothing wrong with our system right now. We just need to tighten up entry requirements so that a lot of people who have been getting in won't be getting in any more. Then we'll only take the cream of the crop for our occupation."

A most useful technique for dealing with such cases is for the facilitator to involve other members of the committee in discussing these issues. Normally the facilitator can rely on one or more committee members to be adequately alert to the potential of the DACUM process (even with limited exposure) to counterbalance the contributions of the dissenting committee member.

16. The Committee that Talks for the Sake of Talk

Some committees are heavily weighted with persons who like to attend meetings, are quite articulate, and enjoy discussion. They prefer to avoid the painstaking work at hand and treat the committee work as an opportunity to air views.

If this attitude dominates and committee work begins to suffer, the facilitator should reorient the committee to the job before them and ask that they limit their discussion to the task currently being discussed in the interest of time and quality. Efforts have been made in the past to apply techniques such as attempting to get the committee to focus more clearly on objectives or attempting to get it to pace itself toward completion of a set of goals. It may also help to mention that over 500 jobs involving persons in over 20 countries have successfully used the DACUM process to analyze all types of jobs, occupations, and processes. Usually, one or a combination of these techniques will be effective. In extreme cases, it has been found necessary to disband the committee and resume the task with a new committee.

17. The Negative Critic

There are persons who excel at criticizing the contributions of others: "That task isn't specified correctly," "That task really doesn't apply," "That is a rather insignificant task to be placing in an occupation like ours," "It's really much more complex than we have suggested." At the same time they will avoid making positive contributions.

Such persons may normally function in negative controlling or monitoring roles and are not comfortable in the positive brainstorming process.

Perhaps the very best way to deal with this potential problem is to specifically address the issue during the orientation by asking everyone to limit their inputs to constructive suggestions or alternatives rather than criticisms.

Another useful technique is to listen alertly to their conversation and promptly write and place a card on the wall when they begin to discuss what could be an identifiable task. Specification of a series of tasks in this way has been effective in converting some to a positive approach.

The only other useful technique has been to encourage the committee to deal with the problem. The facilitator should avoid personally debating the issues raised.

18. The Person Who is Afraid to Contribute for Fear of Exposing Ignorance

Occasionally one encounters a well-qualified recognized expert who has always worked in a situation in which he/she did not have to describe the characteristics or requirements of the occupation. Such an individual avoids contributing even though he/she appears to know what is transpiring in the workshop and is capable of contributing. This type expert may fear that his/her lack of verbal skill will indicate technical incompetence to colleagues on the committee. It is important for the facilitator to detect such an individual almost as soon as the committee's work begins and encourage him/her to make contributions. This is easily done by questioning him/her about poorly worded contributions of others and asking the person's help in refining the definitions. The facilitator should also take every opportunity to solicit a contribution from him/her so that he/she may begin to feel like a contributing member of the group.

Frequently, when such persons emerge from silence, they become the most valuable participant in the workshop because they are direct and do not over-verbalize.

19. The Person Who Rejects Facilitator Leadership

At times an individual will resist the leadership of the facilitator because he/she is not an expert in the occupation and the member distrusts his ability to lead a committee in specifying requirements for a field about which the facilitator knows little.

It is important in such cases to maintain leadership and to apply techniques that will overcome such misgivings. One way is to provide examples of charts that have been developed by diverse committees and in which the facilitator had no more ability than he/she has in this particular occupation. Another technique is to describe the rationale for having an independent person perform in this role. By using a facilitator who lacks knowledge of the occupation being analyzed, the facilitator remains a process expert and will not intentionally or otherwise inject any personal bias.

20. The Authority Figure Who Typically Controls

Some persons typically want to control a group and expect to lead any activity in which they become involved. If not controlled, they will focus discussion, issues, debates, and final decisions around themselves. It is interesting to note that this frequently occurs when most of the committee members have been selected from one firm or one specialty in the occupation. They may have become accustomed to allowing a dominant individual among them to chair meetings and lead activities, and, as a consequence, they allow him/her to assume leadership in the DACUM workshop.

Such persons are difficult to control, and at times it is necessary to apply environmental techniques to overcome this difficulty. It may be necessary, for example, to change the seating arrangements to place the dominant individual either on the periphery of the group or next to the facilitator where he may be more easily controlled. In extreme cases, the facilitator may have to assert responsibility and privately challenge the member, demanding that he/she cease trying to control the group or leave.

21. Instructors Concerned about the Teaching Role

The inclusion of instructors on committees has not worked out well either from the point of view of having the chart developed within a reasonable period of time or from the point of view of possessing current occupational expertise. While there are benefits for the instructor in terms of the opportunity to learn more about the occupation and the views of its experts, a teacher's participation tends to retard the committee process. In cases where instructors must participate, it is frequently necessary to remind them that the issue is not how to teach but the requirements of the occupation which will later become the basis for "**what to teach**." Maintaining this perspective for instructors places a good deal of pressure on the facilitator, and it has been found that committees function more effectively if no instructors are members. However, it has been found to be very beneficial to have teachers and instructors observe the process so they can gain a firsthand technical awareness updating.

22. Persons Who Will Not Address the Facilitator

Sometimes committee members appear to misread the facilitator's role and consistently disregard him/her. Contributions must go through the facilitator if he/she is to maintain control of the process.

The facilitator may insist that all contributions be directed to him/her and refuse to write and put up any definitions that are not so directed. Or he/she can arrange to have the offenders located near them so that they will have to address him/her while studying or commenting on the wall.

23. The DACUM Learning Enthusiast

Some persons have had an opportunity to learn about DACUM beforehand and have become over-enthused about its potential for occupational definition and learning. These might be persons who have been previously exposed to the DACUM to solicit their assistance in selecting committee members. Or they might be instructors (or prospective instructors) who expect to work with the system and are recruited as part of a committee. These individuals at times tend to lose sight of the specific purpose of the committee. They may begin to think too far ahead and worry about structuring or sequencing when the task definition process is not yet complete. They may not grasp the implications of each step in the analysis process because they are too influenced by what they expect to see in the finished chart.

It is necessary to play down the contributions of such persons and recognize only those which are directly based on performance. If such a person is rather vocal and persistently disrupts proceedings with concerns about the training program, it is best to take directive action and explain to him/her in front of the group that this committee's concern is not with training, it is with accurate definition of the tasks of the occupation. The training program will be the concern of another committee made up of persons more qualified for the task of designing and developing training.